

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Aberdeen, County of Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 mile.
Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2 1/2 feet. During the MONTH of January 1883.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 A.M.		P.M.		9 h. A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
		Barometer. * No. —	Attach- ed Ther- mometer	Barometer. No. —	Attach- ed Ther- mometer	Max. No. —	Min. No. —	Max. in Sun rays No. —	Min. on Grass. No. —	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force	Direction.	Force	Readings of the H.Cup Anemometer. No. —	No. of hours in which it fell.	No. —	Amount in inches.	Velocity (0—10), and Direction.	Amount (0—10), and Species.	Velocity (0—10), and Direction.	Amount (0—10), and Species.	No. — 8 inches.					12 inches.	22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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NOTATION USED IN GENERAL REMARKS.			
a.	denotes aurora.	m.	denotes meteor.
cl.	" cirrus.	ms.	" meteors.
cl.-cu.	" cirro-cumulus.	n.	" nimbus.
ci.-s.	" cirro-stratus.	r.	" rain.
cu.	" cumulus.	h. r.	" heavy rain.
cu.-s.	" cumulo-stratus.	c. h. r.	" continued heavy rain.
d.	" dew.	s.	" stratus.
f.	" fog.	sc.	" scud.
fr.	" frost.	s.	" sleet.
h.-fr.	" hoar-frost.	s. h.	" solar halo.
h.	" haze.	sq.	" squall.
h. d.	" heavy dew.	sq.	" squalls.
hl.	" hail.	t.	" thunder.
li. cl.	" light clouds.	t. s.	" thunder storm.
li. sh.	" light showers.	w.	" wind.
lu. co.	" lunar corona.	g.	" gale of wind.
lu. ha.	" lunar halo.		

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction ++ for Temp. (Col. 2), = 29.731 = 29.694
Corrected Mean" of Barometer at 9 P.M., minus the Correction ++ for Temp. (Col. 4), = 29.662 = 29.624
Mean at Station, corrected, and at 32°, = 29.659
Correction for height, 66 feet above Mean Sea-level, = .074
Mean, reduced to 32°, and Sea-level, = 29.733
Highest Reading, corrected for Index error, on the th, = 30.502
Lowest Do. Do., on the th, = 28.612
Difference, or Monthly Range, = 1.890

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the th, = 51.4
Lowest in Month, corrected for Index errors, on the th, = 27.9
Difference, or Monthly Range, = 23.5
"Corrected Mean" of all the Highest, (Col. 5), = 44.0
"Corrected Mean" of all the Lowest, (Col. 6), = 35.4
Difference, or Mean Daily Range, = 8.6
** Calculated Mean Temperature of Month, = 39.7
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, =
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, =
Lowest at Night, Black Bulb, (corrected for Index errors), on the th, =
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, =
Difference of above Means or Range ("exposed"), =
G.D. Range on the 2nd = 17.3

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 39.5
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 37.4
Computed Temperature of Dew-Point, = 34.7 34.7
Do. Elastic Force of Vapour, = .202
Do. Weight of Vapour in a Cubic Foot of Air, ... = 2.33
Relative Humidity, (Saturation = 100), = 83
RAIN fell on /8 Days; Amount in Inches, = 3.23

WIND. SUMMARY.											
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	1	0	2	4	7	7	6	3	1	1.21	
P.M.	0	0	1	4	9	3	5	5	4	1.29	
Mean.	1	0	1	4	8	5	5	4	3	1.25	= 1.56

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

(Signed)

H. P.
H. P.
2.50
1.25
1.56

Worcester
Jan 1883

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; and the Agricultural condition of the district generally.

SCOTTISH METEOROLOGICAL SOCIETY.

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

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

During the MONTH of February 1883.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.				SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 A.M.		P.M.		9 h. A.M.		Temperature of WELL at depth of feet. 36.	Temperature at 1 fathom, and Depth.	9 A.M. 9 P.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		Barometer. * No.	Attached Thermometer	Barometer. No.	Attached Thermometer	Max. No.	Min. No.	Max. in Sun/rays	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	Readings of the H. Cup Anemometer. No. —	No. of hours in which it fell.	Amount in inches.	Velocity (0—10), and Direction.	Amount, (0—10), and Species.	Velocity (0—10), and Direction.				Amount, (0—10), and Species.					No. 8 inches.	12 inches.	No. 22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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NOTATION USED IN GENERAL REMARKS.			
a.	denotes aurora.	m.	denotes meteor.
ci.	cirrus.	ms.	micro-meteor.
ci-cu.	cirro-cumulus.	n.	nimbus.
ci-s.	cirro-stratus.	r.	rain.
cu.	cumulus.	h.r.	heavy rain.
cu-s.	cumulo-stratus.	c.h.r.	continued heavy rain.
d.	dew.	s.	stratus.
f.	fog.	sc.	scud.
fr.	frost.	s.	sleet.
h-fr.	hoar-frost.	s.	snow.
h.	haze.	so.ha.	solar halo.
h.d.	heavy dew.	sq.	squall.
h.	hail.	sq.	squalls.
l.	lightning.	t.	thunder.
li.cl.	light clouds.	t.s.	thunder storm.
li.sh.	light showers.	w.	wind.
lu.co.	lunar corona.	g.	gale of wind.
lu.ha.	lunar halo.		

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction (†) for Temp. (Col. 2), = 29.753
 Corrected Mean" of Barometer at 9 P.M., minus the Correction (†) for Temp. (Col. 4), = 29.772
 Mean at Station, corrected, and at 32°, = 29.762
 Correction for height, 66 feet above Mean Sea-level, = .074
 Mean, reduced to 32°, and Sea-level, = 29.836
 Highest Reading, corrected for Index error, on the th, = 30.508
 Lowest Do. Do., on the th, = 29.022
 Difference, or Monthly Range, = 1.486

S.-R. THERMOMETER, (in shade, etc), Highest in Month, (corrected for Index Errors), on the th, = 56.6
 Lowest in Month, corrected for Index errors, on the th, = 31.8
 Difference, or Monthly Range, = 24.8
 "Corrected Mean" of all the Highest, (Col. 5), = 46.9
 "Corrected Mean" of all the Lowest, (Col. 6), = 37.4
 Difference, or Mean Daily Range, = 9.5
 ** Calculated Mean Temperature of Month, = 42.2
 S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, =
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, =
 Lowest at Night, Black Bulb, (corrected for Index errors), on the th, =
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, =
 Difference of above Means or Range ("exposed"), =
 g.s. Range on the 25th = 19.1

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 44.6 41.8
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 37.6 37.6
 # Computed Temperature of Dew-Point, = 37.4 36.9
 # Do. Elastic Force of Vapour, = 42.2 22.1
 # Do. Weight of Vapour in a Cubic Foot of Air, = 2.56 2.54
 # Relative Humidity, (Saturation = 100), = 85 84
 RAIN fell on 19 Days; Amount in Inches, = 4.28

SUMMARY.											
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	2	2	1	0	9	6	2	6	0	1.25	
P.M.	2	0	1	1	7	8	3	3	1.27		
Mean.	2	1	1	1	8	7	2	4	2	1.26	1.59

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

Observations made and Return verified by James Dale - Teacher
Re. Gordon's College, Abda

(Signed) H.A.
H.A.
1587

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

The Council of the Society recommend that the Self-registering Thermometers, and the Dry and Wet Bulb Hygrometers, be kept in Stevenson's Louver-boarded Box for Thermometers, painted white inside and outside, and screened to four stout posts, also painted white, firmly fixed in the ground. The posts must be of such a length that when the Thermometers are hung in position the Bulbs of the Minimum Thermometer, and of the Dry and Wet Bulb Thermometers will be exactly at the same height of four feet above the ground, the Minimum Thermometer being hung immediately above the Minimum Thermometer. The thermometer box is to be placed over a plot of grass, and in a free open space to which the sun's rays have free access, and as much of the day as surrounding conditions enable the Observer to secure. The Thermometers are suspended on cross-laths in the middle of the Box, and face the door, which should open to the north. The Council regard the question of *STANDARD OF HEIGHT ABOVE GROUND*, and *MEANS OF PROTECTING THE THERMOMETERS*, as vital in every system of Meteorological Observation, since without it Observations made at different Stations are incomparable, thus rendering impossible to compare the Climates of places with each other as regards their most important features.

Professor Phillips, and Negretti and Zambra's Maximum Thermometers, and Kutherford's Minimum Thermometers, which are recommended. It is recommended that these Thermometers be graduated on the glass scale. The Minimum Thermometer is liable to two disadvantages—viz., the occurrence of spirit breaking, and part of the spirit distilling by high temperature and lodging at the top of the tube. This derangement of the instrument may be avoided by the use of the following precaution:—The occurrence of occasional occurrence with Protected Thermometers. Hence a systematic examination of Minimum Thermometers ought to be a regular part of the work carried on by each Observer.

Fortunately, Spirit Thermometers may be easily set right by any

unimpaired to compare the climates of places with each other as they are. The only safe mode at present is to compare the climates of different Stations as they are, and to make the comparison on the basis of the actual observations made at the Stations. The only safe mode at present is to compare the climates of different Stations as they are, and to make the comparison on the basis of the actual observations made at the Stations.

Fortunately, Spirit incarnations may be easily set right. The three portions of spirit chances to separate. Let the Thelema be taken in the hand by the farthest from the bulb, and the other two be swung down towards the bulb, and then forcibly swung down towards the head, and then forcibly swung down towards the feet; the object being, on the principle of centrifugal force, to send the detached portion of spirit (all it unites with the column, even throws, or swinging strokes, will generally be sufficient for the

For the purpose of measuring the amount of steam evolved from a substance, the thermometer should be placed in a slanting position, so that the bulb is at the top of the column of liquid. The rest of the spirit shall adhere to the sides of the tube to allow room to the column. But another method must be adopted, if the portion of spirit in the top of the tube be small. The thermometer should be applied slowly and cautiously to the top end of the tube, and the bulb should be placed where the detached portion of spirit is, which, being turned over, will cause the vapor to rise to the top of the tube, and the bulb will be in contact with the heat, will contain on the surface of the unbroken column of spirit. Care must be taken that the heat is not applied too quickly; for, if this be done, the bulb will break and the instrument will be destroyed. The best way to apply the requisite amount of heat is by bringing the tube slowly down towards a spirit lamp, or a plate of iron heated from a gas-burner; or, if gas be not at hand, a piece of incandescent metal will serve better.

The bulbs of thermometers for registering the greatest heat from the sun's rays, and the best for atmospheric radiation, are made of black coating, which very readily

Black-bull thorn.—A thorny shrub having a black coating, which may easily be rubbed off, and is, or is deemed, by the application of a mixture of water and lime, to be a good preservative against the attacks of the lampblack and printer's ink. They are placed in shallow wooden or metal boxes, whose sides protect the bulls from the wind. The bulls of Maximus should be freely exposed to the sun, and the Minimus should rest on wooden supports a few inches from the surface of the grass, in an open situation. Now must not be allowed to enter either of these Thormonsters. Show the sun's heat to affect the Thormonster by disflaming. Black-bulls enclosed in Thormonster Thormonster may also be used, being mixed preferable to the glass jackets.

It must, however, be added, that the whole subject of the conservation of Solar and Terrestrial Radiation is not yet in a sufficiently advanced state to warrant the exclusive recommendation of any one of these methods.

The Hygrometer in use at the Society's Stations consists of two Thermometers usually, but not necessarily, mounted on one frame. As apparently slight deviations from the approved form of this apparatus seriously vitiate the Hygrometrical Observations. Observers are specially requested to attend to the following conditions:—The bulbs must hang down at least an inch free from the scales and frame to which they are

at least an inch five from the sides 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 up must be covered, and altogether placed to the side, and a little below the level of the wet bulb, but in no case under the bulbs; the reservoir must be of medium fineness, and fashioned at the neck by the cotton, which also supplies it with water. It must be given to the Observer that the muslin is always cleaned moist,

seen by the Observer that the muslin is always clean and moist, and that the water pure. In frosty weather, observation is a matter of such delicacy, and must be made with great care. The bulb must be moistened by immersion from 15 to 30 minutes before the hour of observation. From the film of ice thus formed evaporation will proceed as from the moist cloth in ordinary circumstances. In reading the Thermometer great care must be taken to

In reading the Thermometer great care must be taken to bring the eye exactly opposite the tip of the index or column of mercury. The reading ought to be taken to tenths of a degree, and noted in decimals. Thus the Thermometer will be read— $38^{\circ}.9$, $40^{\circ}.0$, or $40^{\circ}.1$; or again, $38^{\circ}.9$, $40^{\circ}.5$, $40^{\circ}.6$, according as it indicates a little under, an exact, or a little over 40° (or $40^{\circ}.5$ respectively). So also

0.04, 0.05, 0.06, or on a little over 40° C. respectively. So also the 40° C. thermometer may or less may be registered 40° 2, or 40° 3, and also 40° 4, or 40° 5, respectively. In reading Rutherford's Minimum Thermometer, the indication of that end of the index which is next to the 40° mark is the true temperature. On opening the thermometer the surface of the spirit is also noted. On opening the thermometer, the Dry and Wet Bulb Thermometers are to be first, and secondly, read, inasmuch as they are readily affected by heat from the action of the observer.

The Hygrometer is read at 9 a.m. and 9 p.m. The Self-Registering Thermometers are read at 9 p.m. only, as indicating the greatest and least degrees of temperature in the 24 hours preceding. It is not a matter of indifference

How of temperature
of thermometer

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 31 are those of phenomena commencing at 9 p.m. on the 24, and extending to 9 p.m. on the 31.

No instrument ought to be used for Meteorological purposes till it will still 9 p.m. on the 31.
it has been carefully tested by comparison with a Standard Thermometer. When such Thermometers are as yet not graduated on the stem, but merely on the attached scale, undergoes repairs, they are very liable to be moved from their position on the Scale, and might never afterwards to be used without being re-tested. The Self-Registering, especially the Minimum Thermometers, ought frequently to be compared with the bulb of the Hygrometer. The freezing-point of each Thermometer, marked by a scratch on the tube, ought to be tested once a year, in snow or melting ice.

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

1. *As regards Direction.*—Wind, the accuracy of which, both as regards Direction and Force, is so essential towards the right measurement of many of the more important problems of the atmosphere. A Wind-Vane ought to be elevated at least 12 feet above surrounding objects. When it oscillates incessantly, the mean direction should be taken. In all cases, but especially when the Vane is stationary, and when the wind is feeble, reference may be made to the direction of smoke, etc., to be made on the changes in the direction of the wind; and during system observations at every hour of Greenwich time. Such extra observations observation, pursued at different Stations, are likely to give highly valuable and important results, particularly a connection with the system of thickly-planted Stations over a limited district round Edinburgh called *Snow Stations*, in the investigation of the relation of the force of the wind to *BAROMETRIC PRESSURES*, and other points connected with storms. The Council would recommend the Hemispherical Cup Anemometer,—a self-registering instrument which shows the amount of Wind that passes it per day; from which also the mean Velocity of the Wind at the time of observation may be ascertained. For indicating the Force of the Wind at any particular hour of observation, the Pressure Anemometers recently brought under the notice of the Society by Mr. T. Stevenson, the Honorary Secretary, and Mr. R. Bullough, the Society's Observer at Exhilaris, are recommended as likely to secure uniformity in making observations on the Force of the Wind. Many causes conspire to produce anomalies in Rain Returns, arising partly from the difficulty of obtaining a perfectly unobstructed situation for observation, and partly from the defective nature of the instruments used. On the Rain-Gauge should not be placed on a slope or terrace, but the Rain-Gauge should be in an open situation as the Observer has no secret for it. As it is often difficult to obtain a position where should be taken to place it at some distance from shrubs, trees, buildings or other obstructions, at least as many feet from their base as they are in height. The more important directions, towards which it is most desirable to have a free exposure, are in the order of their importance, S.W., N.E., S.E., S., and W. The amount of the Gauge must be perfectly level, and fixed so that it will remain in the same position, and be at a height of one foot above ground, over grass. In such gauges as Fleming's, which are furnished with a measuring rod attached to a float, the rod ought to be fixed down, and the float rise to its height only at the time the instrument is read, it being found that a stem projecting above the rim of the Gauge seriously interferes with the proper measurement of the Rain-fall. When a measuring glass is used, care ought to be taken to hold it quite perpendicular. The Rain-Gauge ought to be periodically read, at 9 A.M., and the reading entered on the form to be made daily at the first of the month, and at a month entered for the previous month. Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a Snow-fall occurs, it should be noted in the Remarks. The depth of Snow 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, as a check upon, the observations of the Rain-Gauge. For wind, rain, and snow, as indicated in every column, the Observer cannot be too careful to register observations only; and nothing that partakes of the nature of conclusion or inference. Convenient abbreviations for the nomenclature of Clouds will be found on the other side. The amount of Cloud ought to be estimated from the greater or less obscuration of the sky overhead (i.e., within 20° or 30° of the zenith). The strata of Clouds that appear near the horizon are viewed obliquely; and thus being unable to judge of their amount, we ought not to take them into account in the Clouds' column, though their appearance and changes may be noted among the Remarks. The amount of Cloud is inferred from a scale of 0 to 10; thus, when the sky overhead is free from Clouds it is entered 0, when half covered by Clouds, 5, wholly covered, 10, and so on. Observations of the Clouds are made at 9 A.M. and at sunset, as illustrating the condition and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner:—Thus, in the column Velocity and Direction, S.W. will indicate that the upper strata of Clouds travel with extreme velocity from S.W., and those in the lower regions from W., with one-third the speed of the former. Again, in the second column, an entry of $\frac{1}{4}$ st. will indicate that the higher regions are covered to the amount of 4-tenths with stratus Clouds; and that the sky is further obscured to the extent of 2-tenths by lower Clouds of the cumulo stratus kind. Remarks on peculiar Clouds, accompanied with drawings, will assist materially in the development of a more exact nomenclature of Clouds, as well as throw light on the electrical, and other of the more obscure phenomena of Meteorology. The approximate number of Hours in which objects in the sun's rays cast shadows, should be entered in the proper column. Such as the germination and growth of crops and plants generally, depend greatly on the temperature of the soil,—its amount and constancy,—the Council recommend that Observations in this interesting department be made at 9 A.M., by Thermometers permanently fixed in the soil, their bulbs being sunk to depths of 3, 12, and 22 inches, and the stems above ground protected from the sun's rays and fitted with sloping tin collars, to prevent rain water being conveyed to the bulbs by the stems or wooden frames. A knowledge of the Temperature of the Sea is not only in itself, but in its relations to that of our island, a most important branch of Meteorology. The Council therefore recommend that the Temperature of the Sea be carefully taken by a properly constructed apparatus, from boats, or if this be impracticable, from the ends of piers and rocks round the coast, where it is not influenced by that of river water, and as tide influenced as possible by currents sweeping along the coast, and as tide acquiring the temperature of the land, either greatly heated by the sun or cooled by nocturnal radiation. At or near thirty fathoms of high

[illegible]

A horizontal strip of a document page, showing a postage stamp and a small rectangular label. The strip is light-colored and appears to be a scan of a physical document. The postage stamp is located on the left side of the strip, featuring a circular design with a central emblem. To the right of the stamp is a small, rectangular, light-colored label. The background of the strip is a dark, textured surface.

SCOTTISH METEOROLOGICAL SOCIETY.

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

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

During the MONTH of March 1883.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.				SEA.	OZONE.		GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.			
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 A.M.		P.M.		9 h. A.M.				0—10.									
		Barometer. No. —	Atmospheric Thermometer No. —	Barometer. No. —	Atmospheric Thermometer No. —	Max. No. —	Min. No. —	Max. in Sun's rays No. —	Min. on Grass. No. —	Dry bulb. No. —	Wet bulb. No. —	Dry bulb. No. —	Wet bulb. No. —	Direction. No. —	Force No. —	Direction. No. —	Force No. —	9 h. A.M.	No. of hours in which it fell.	Amount in inches.	Velocity (0—10), and Direction.	Amount (0—10), and Species.	Velocity (0—10), and Direction.	Amount (0—10), and Species.	No. —	3 inches.	12 inches.		22 inches.	Temperature of Wells at depth of feet. No. —			Temperature at 1 fathom, and Density.	9 A.M.	9 P.M.
		* No. —	°	No. —	°	No. —	°	No. —	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°		°	°			°	°	°
	1	30.442	47.0	30.472	49.0	57.0	41.0			44.0	42.5	41.8	40.1	N	½	—	—																1		
	2	30.532	49.0	30.648	50.0	57.8	34.5			45.4	43.6	46.0	43.9	S.W.	½	—	—																2		
	3	30.582	43.0	30.696	46.6	46.8	38.5			41.0	39.8	40.8	40.0	S.W.	1	S	1																3		
	4	30.622	41.4	30.652	46.4	50.1	30.4			40.0	38.1	39.3	37.1	S.W.	½	S.W.	½																4		
	5	30.540	47.6	30.306	47.0	52.3	36.3			42.2	37.6	43.0	38.2	W.	1	N.W.	3																5		
	6	30.270	42.0	30.296	40.0	44.0	27.2			32.0	31.0	32.0	31.0	N	3	N	4																6		
	7	30.108	41.0	29.996	41.0	35.4	28.2			33.6	32.4	29.4	29.0	N	3	N	2																7		
	8	30.094	42.0	30.200	43.0	39.0	28.4			28.8	28.8	35.4	34.2	N.E.	3	N.E.	1																8		
	9	30.054	40.2	29.886	45.2	41.0	30.6			34.6	33.8	35.0	23.0	N.	1	—	—																9		
	10	29.850	42.0	29.766	41.0	44.1	31.2			37.6	36.2	36.2	35.1	N.W.	½	N.W.	1																10		
	11	29.680	41.0	29.718	39.2	37.2	28.0			33.6	33.0	30.9	29.6	N.W.	2	N	½																11		
	12	29.846	39.0	29.910	41.0	40.0	28.2			34.8	34.3	32.0	31.6	N	1	—	—																12		
	13	29.852	39.0	29.766	40.0	42.0	27.2			34.7	31.0	34.0	32.7	N.W.	1	N.W.	1																13		
	14	29.828	42.0	29.780	42.0	40.0	27.5			39.0	38.6	29.8	28.8	E.	1	N.E.	1																14		
	15	29.680	37.0	29.574	42.0	37.0	26.8			32.1	30.7	33.2	32.0	N.E.	1	N.E.	1																15		
	16	29.266	41.0	29.370	40.0	36.0	25.2			35.8	34.9	28.8	28.0	N	1	N.W.	1																16		
	17	29.316	40.0	29.580	40.0	37.8	25.8			33.7	32.0	36.0	34.1	E	2	E	3																17		
	18	29.500	40.0	29.768	42.0	44.0	31.6			34.4	33.8	37.0	35.2	S.E.	1	S.E.	2																18		
	19	29.914	42.0	30.070	44.0	39.4	32.6			39.1	37.5	37.2	35.0	S.E.	2	S.E.	1																19		
	20	29.952	41.6	29.842	42.0	38.3	35.0			36.4	34.2	38.0	34.2	S.E.	1	—	—																20		
	21	29.888	41.6	30.240	42.0	42.0	34.1			36.5	35.4	35.8	32.4	E.	½	E.	½																21		
	22	30.438	41.0	30.474	43.0	40.3	32.6			34.8	32.6	34.2	30.2	E.	1	E	1																22		
	23	30.358	40.0	29.970	42.0	41.2	27.5			32.1	29.4	35.2	32.0	S.W.	1	W	1																23		
	24	29.706	41.0	29.580	40.0	43.2	29.8			33.8	31.8	32.5	31.2	N.E.	3	N	½																24		
	25	29.404	40.0	29.174	40.0	35.0	29.5			32.0	32.0	30.9	30.0	S.W.	1	N	1																25		
	26	29.136	38.0	29.338	41.0	40.6	26.8			32.0	31.0	30.2	29.0	N.W.	1	—	—																26		
	27	29.506	40.0	29.570	40.0	41.0	26.5			33.8	32.1	31.0	29.7	—	—	N.W.	1																27		
	28	29.596	39.0	29.970	43.0	35.2	25.4			29.0	28.2	33.3	33.0	N.W.	1	N.W.	½																28		
	29	29.756	44.0	29.240	45.0	41.1	28.4			37.2	34.3	39.8	38.1	S.W.	½	S.W.	4																29		
	30	28.926	45.0	29.278	45.0	44.7	34.6			42.3	41.0	36.2	32.4	S	3	S.W.	1																30		
	31	29.562	46.0	29.912	44.0	47.8	33.3			42.8	37.9	36.7	33.5	S.W.	½	—	—																31		
Sums.		1744	10.1	1719	8.1	126	17.12			1612	1310	1510	13.7		3		2																		
		27.578	52.8	27.874	88.1	61.7	12.2			190.1	134.7	161.6	102.3		41.5		35.5																		
Means.		29.890	41.7	29.899	42.8	42.0	30.4			36.1	34.3	35.2	33.3		1.34		1.15																		
† Total Corrections for Instrumental Errors.		+0.006	-0.7	+0.006	-0.7	-0.3	—			-0.2	-0.2	-0.2	-0.2		0.6		0.6																		
‡ Corrections for Diurnal Range.																																			
"Corrected Means."		4.0		42.8	41.7	30.4				35.9	34.1	35.0	33.1																						
No. of		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				

NOTATION USED IN GENERAL REMARKS.

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

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction†† for Temp. (Col. 2), = 29.862
 Corrected Mean" of Barometer at 9 P.M., minus the Correction†† for Temp. (Col. 4), = 29.869
 Mean at Station, corrected, and at 32°, = 29.866
 Correction for height, 66 feet above Mean Sea-level, = .072
 Mean, reduced to 32°, and Sea-level, = 29.938
 Highest Reading, corrected for Index error, on the 4 th, = 30.652
 Lowest Do. Do., on the 30 th, = 28.926
 Difference, or Monthly Range, = 1.726

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the th, = 52.0
 Lowest in Month, corrected for Index errors, on the th, = 25.2
 Difference, or Monthly Range, = 26.8
 "Corrected Mean" of all the Highest, (Col. 5), = 41.7
 "Corrected Mean" of all the Lowest, (Col. 6), = 30.4
 Difference, or Mean Daily Range, = 11.3
 ** Calculated Mean Temperature of Month, = 36.0
 S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the th, = —
 "Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = —
 Lowest at Night, Black Bulb, (corrected for Index errors), on the th, = —
 "Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = —
 Difference of above Means or Range ("exposed"), = —
G. D. Range on the 4th. 19.4

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 35.4
 Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 33.6
 ‡ Computed Temperature of Dew-Point, = 30.8
 ‡ Do. Elastic Force of Vapour, = .173
 ‡ Do. Weight of Vapour in a Cubic Foot of Air, = 2.06
 ‡ Relative Humidity, (Saturation = 100), = 83
 RAIN fell on 24 Days; Amount in Inches, = 3.83

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

* Each instrument tested at the Office in Edinburgh bears the stamp "S.M.S.;" and a number to be entered in the Heading; or the Number and Initials of the Maker may be given.
 † Embracing corrections for both capillarity and Index Errors.
 ‡ The Diurnal Range for Scotland is as yet unknown.
 †† These "Hygrometrical Deductions" are calculated from Gladstone's Hygrometrical Tables, Second Edition only.
 ‡‡ While the Diurnal Range is unknown, the Artificial Mean of Cols. 9 and 6 will be entered as the "Calculated Mean Temperature."
 Any Observations not taken under the conditions specified in the Directions on the other side, or noted at the Top of each column, must be marked as such by the observer, in each Schedule. See over.

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

(Signed) H. R.
H. R.
1883

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

OBSERVATIONS,

Aburdeen
Mar 1883

To

Mr ALEXANDER BUCHAN,

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

BOOK POST.

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

The Temperature of the water at the bottom of Walls ought, when practicable, to be taken, both the depth of the water and the nature of the bottom being noted.

When what Test-Papers are used, Schönbein's or Moffat's, etc. The Paper is affixed by a pin to a board in the direction of the wind, and the indications registered at 9 A.M. and 9 P.M. It is desired that these indications be registered in connection with the force and direction of the wind at the time of observation, in the following manner:—thus 3 S.W., as an example, in the schedule will indicate that the Ozone paper is tinted a pale blue on the scale, that the wind is from the N.W., and that its force on the scale 0-5 is 4, or blowing fresh.

Too much importance cannot be attached to the electric condition of the atmosphere in connection with terrestrial magnetism, barometrical, thermometrical, and meteorological phenomena generally. A proper Electrometer is, in truth, necessary to every complete meteorological observatory. The Remarks column is unavoidably too narrow. Some of the most valuable observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions, ought, therefore, to be taken every advantage of, and a list of such as are in general use are given at the foot of the column. Besides special and extraordinary observations, great prominence ought to be given in this column to Prevalent Diseases, differences in character, colour, velocity, and direction between the Lower and Upper Strata of Clouds, the Colour of the Barometer, remarkable depressions, elevations, and fluctuations of the Barometer, Thunder-Storms and remarkable falls of Snow, Hail, or Rain, the Hour of Storms of Wind commencing, attaining their maximum, and ending, as well as such notes as Storms have been hinted at above. When lofty hills are in the vicinity of a Station, the Height of Clouds and of the Snow-line in winter should be recorded. By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. should be registered either in two columns, otherwise unoccupied, or ruled off for the purpose, from the column of Remarks.

Observations in connection with the Periodic Return of the Seasons, possess not only great scientific value, but are of considerable importance in connection with Agriculture, Horticulture, and Natural History. The Council would direct the special attention of Observers to the registration of such phenomena, so that the published Summaries may fairly represent the whole of Scotland. Observations ought to be confined to individual trees and shrubs; to particular species of birds, and, in the case of crops, to specified sorts reared from year to year on a selected piece of ground or farm. The Annual Table, published yearly in the Society's Journal, will indicate the species of plants and animals to which special attention is more particularly directed.

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

(By Order)
Edinburgh, December 1880.

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

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

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

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

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

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

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

Observations of the Clouds are made at 9 A.M. and at sunset, as illustrating the condition and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner:—Thus, in the column Velocity and Direction, 6, S. W.

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

As regards the development of a storm, a nomenclature of Clouds, as well as those light on the electrical and other of the more obscure phenomena of Meteorology, which objects in the sun's column.

The approximate number of Hours which objects in the sun's column.

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The Council of the Society recommend that the Self-Registering Thermometers, and the Dry and Wet Bulb Hygrometers, be kept in Stevenson's Louver-boarded Box for Thermometers, painted white inside and outside, and covered with four stout posts, also painted white, firmly fixed in the ground. The posts must be of such a length that when the Thermometers are hung in position, the Bulbs of the Minimum Thermometer, and of the Dry and Wet Bulb Thermometers will be exactly at the same height of four feet above the ground, the Maximum Thermometer being hung immediately above the Minimum Thermometer. The Thermometer Box is to be placed over a plot of grass, and in a free open space so that the sun's rays have free access during as much of the day as surrounding conditions enable the Observer to secure. The Thermometers are suspended on cross-laths in the centre of the Box, and face the door, which should open to the north. The Council regard the question of EXTERMINITY OF HEIGHT ABOVE GROUND, AND MINIMUM OF PROTECTION OF THERMOMETERS, as vital in every system of Meteorological Observation, since without it Observations made at different Stations are incomparable, thus rendering it impossible to compare the climates of places with each other as regards their most important features.

Professor Phillips, and Negretti and Zamboni's Maximum Thermometers, and Ruthven's Minimum Thermometer, are recommended. It is recommended that these Thermometers be graduated on the glass stem. The Minimum Thermometer is liable to two demerits—viz., the column of spirit breaking and part of the tube, the spirit distilling by high temperature and lodging at the top of the tube. This demerit is of occasional occurrence with Protected Thermometers, but of frequent occurrence with exposed Thermometers. Hence a systematic examination of Minimum Thermometers ought to be a regular part of the work carried on by each Observer.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, County of Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2½ feet.During the MONTH of April 1883.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.	
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		9 A.M.		P.M.		9 h. A.M.									
		Barometer. * No. —	Atmos- phere Ther- mometer	Barometer. No. —	Atmos- phere Ther- mometer	Max. No. —	Min. No. —	Max. in Sun's rays No. —	Min. on Grass. No. —	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	9 h. A.M.	No. of hours in which it fell.	Amount in inches.	Velocity (0—10), and Direction.	Amount (0—10), and Direction.	Velocity (0—10), and Direction.	Amount (0—10), and Direction.	No. — 3 inches.	No. — 12 inches.					No. — 22 inches.
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°					°
	1	30.090	44.0	30.064	45.0	52.2	35.0			43.2	39.4	43.0	39.2	W	2	S.W.	1	—	St	10	4	12								1	
	2	29.898	45.0	29.844	46.6	48.2	39.5			45.0	41.2	46.1	45.0	S	1	S	2	—	—	—	10	8								2	
	3	30.096	46.5	30.264	47.5	51.1	39.5			47.6	46.0	43.2	41.9	N.W.	1	—	—	—	—	—	—	12								3	
	4	30.032	48.0	30.076	48.0	57.8	38.5			52.6	48.5	53.5	49.8	S.W.	2	—	—	—	—	—	—	10								4	
	5	30.134	46.5	30.440	48.4	54.0	41.1			47.0	41.8	43.4	41.9	N	2	S.W.	2	—	—	—	—	6								5	
	6	30.580	47.5	30.636	49.8	53.0	38.1			45.0	43.5	41.5	39.5	W	2	S	2	—	—	—	—	11								6	
	7	30.518	48.5	30.486	50.2	60.2	37.8			49.5	45.0	50.0	45.1	S.W.	2	—	—	—	—	—	—	12								7	
	8	30.456	49.5	30.440	50.0	62.2	39.1			52.0	49.5	51.8	47.5	W	2	—	—	—	—	—	—	10								8	
	9	30.370	51.0	30.424	50.0	54.3	44.3			50.5	47.8	46.0	43.0	N.W.	1	N.	1	—	—	—	—	—								9	
	10	30.420	47.0	30.312	50.0	57.2	41.8			44.6	42.0	43.8	42.4	N	1	—	—	—	—	—	—	8								10	
	11	30.260	50.0	30.290	51.0	56.0	43.0			49.0	44.8	47.8	46.2	S.W.	1½	—	—	—	—	—	—	—								11	
	12	30.172	50.0	29.906	51.0	52.0	43.6			49.0	46.1	46.2	44.8	—	—	S.E.	2	—	—	—	—	—								12	
	13	29.696	51.0	29.758	51.0	53.8	42.0			50.1	45.2	48.7	45.8	S.W.	1½	—	—	—	—	—	—	9								13	
	14	29.736	52.0	29.620	51.0	57.0	41.6			50.2	45.1	47.8	44.2	S.W.	1	S.W.	2	—	—	—	—	13								14	
	15	29.456	51.4	29.498	51.2	58.2	40.6			51.0	47.6	41.4	38.6	S.W.	1½	W	1	—	—	—	—	14								15	
	16	29.580	51.0	29.600	47.0	54.0	36.0			46.8	41.0	41.0	37.8	W	2	W	2	—	—	—	—	12								16	
	17	29.664	48.0	29.490	50.2	48.7	36.5			43.1	40.9	45.4	42.9	S.W.	2	S.W.	1	—	—	—	—	3								17	
	18	29.336	50.6	29.410	51.0	57.0	42.8			46.0	43.1	47.0	45.1	S	2	S	1½	—	—	—	—	5								18	
	19	29.628	49.0	29.746	49.0	47.1	41.9			46.1	45.0	43.1	42.1	S.	2	S	2	—	—	—	—	—								19	
	20	30.052	48.8	30.316	48.0	44.8	40.0			44.0	42.6	42.0	40.6	S.E.	1	S.E.	1	—	—	—	—	—								20	
	21	30.444	48.6	30.430	48.0	48.2	38.2			46.1	42.2	41.8	39.8	S.E.	1	S.E.	2	—	—	—	—	12								21	
	22	30.424	49.0	30.410	48.2	51.1	39.0			48.5	44.6	42.0	40.2	S.E.	1	S.E.	2	—	—	—	—	13								22	
	23	30.244	46.8	29.960	46.5	48.0	35.4			44.1	40.1	41.5	38.6	S.E.	1	N.E.	1	—	—	—	—	14								23	
	24	29.836	46.0	29.720	47.8	49.0	35.8			43.0	40.2	41.4	41.1	S.E.	1	—	—	—	—	—	—	—								24	
	25	29.616	48.0	29.580	48.0	48.8	40.1			43.1	42.1	43.0	42.8	E	1	—	—	—	—	—	—	—								25	
	26	29.708	47.6	29.766	48.0	53.3	38.2			44.2	42.3	44.0	41.8	S	2	S	1	—	—	—	—	12								26	
	27	29.746	47.2	29.654	49.0	48.0	40.0			44.2	42.3	44.8	42.7	S.E.	1½	S.E.	1½	—	—	—	—	6								27	
	28	29.640	48.0	29.644	48.5	49.0	43.0			45.4	43.7	46.0	43.2	S.E.	1½	S.E.	2	—	—	—	—	4								28	
	29	29.754	49.0	29.824	49.0	53.8	43.8			50.1	45.2	47.9	44.9	S.E.	1½	S.E.	2	—	—	—	—	14								29	
	30	29.850	50.0	29.968	49.0	53.1	40.2			49.3	45.1	44.2	42.1	S.E.	1	E	2	—	—	—	—	15								30	
	31																													31	
Sums.		44.15.11	77.6	16.13.9	15.4	15.7	13.0			14.6	12.9	11.0	14.14	7	6			177	174	185	235										
Means.		29.416	48.5	29.576	48.9	52.5	39.9			47.1	43.8	45.0	42.7	1.03	0.58			5.8	6.2												
† Total Corrections for Instrumental Errors.		+0.006	-0.7	0.006	-0.7	-0.4	-0.1			-0.2	-0.3	-0.2	-0.3	0.6	0.6																
† Corrections for Diurnal Range.																															
"Corrected Means."		29.987	47.8	29.992	48.2	52.1	39.8			46.9	43.5	44.8	42.4																		
No. of Column.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

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

TABLE FOR ESTIMATING FORCE OF WIND.					
Estimated Force, 0—6.	Common Designation.	Estimated Force 0—6.	Common Designation.	Estimated Force, 0—6.	Common Designation.
0	Calm	1-5	Light breeze	4	Blowing hard
0-5	Very light air	3-	Fresh breeze	5	Blowing a gale
1-	Light air	8-	Very fresh	6	Violent gale

NOTATION USED IN GENERAL REMARKS.

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

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction†† for Temp. (Col. 2), = 29.935
Corrected Mean" of Barometer at 9 P.M., minus the Correction†† for Temp. (Col. 4), = 29.939
Mean at Station, corrected, and at 32°, = 29.937
Correction for height, 66 feet above Mean Sea-level, = 0.072
Mean, reduced to 32°, and Sea-level, = 30.009
Highest Reading, corrected for Index error, on the 6 th, = 30.636
Lowest Do. Do., on the th, = 29.336
Difference, or Monthly Range, = 1.300

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the th, = 61.8

Lowest in Month, corrected for Index errors, on the th, = 34.9

Difference, or Monthly Range, = 26.9

"Corrected Mean" of all the Highest, (Col. 5), = 52.1

"Corrected Mean" of all the Lowest, (Col. 6), = 39.8

Difference, or Mean Daily Range, = 12.3

* Calculated Mean Temperature of Month, = 46.0

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

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

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

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

Difference of above Means or Range ("exposed"), =

G.D. Range on the 8th. = 22.8

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry

Bulb, (Cols. 9 and 11), = 45.8

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

10 and 12), = 43.0

† Computed Temperature of Dew-Point, = 39.8

† Do. Elastic Force of Vapour, = 2.46

† Do. Weight of Vapour in a Cubic Foot of Air, = 2.82

† Relative Humidity, (Saturation = 100), = 8.0

RAIN fell on // Days; Amount in Inches, = 1.77

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

(Signed)

Observations made and
Return verified by

James Dale, Teacher in
Robert Gordon's College

H.R.
H.P.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Aberdeen, County of Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.
Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2 feet. During the MONTH of May 1883.
The Hours of Observation : of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.						SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.				SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer.		No. of hours in which it fell.	No.	9 A.M.		P.M.		9 h. A.M.								No.	No.	No.	No.	No.	No.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		Barometer. * No.	Attached Thermometer	Barometer. No.	Attached Thermometer	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	No. 3 inches.	No. 12 inches.			No. 22 inches.	No. 3 inches.	No. 12 inches.	No. 22 inches.	No. 3 inches.	No. 12 inches.	No. 22 inches.	No. 3 inches.											No. 12 inches.	No. 22 inches.	No. 3 inches.	No. 12 inches.	No. 22 inches.	No. 3 inches.	No. 12 inches.	No. 22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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BAROMETER, "corrected Mean" at 9 A.M., minus the Correction for Temp. (Col. 2), = 29.886 ... 0.58 = 29.828
"corrected Mean" of Barometer at 9 P.M., minus the Correction for Temp. (Col. 4), = 29.877 ... 0.59 = 29.818
Mean at Station, corrected, and at 32°, = 29.823
Correction for height, feet above Mean Sea-level, = 0.74
Mean, reduced to 32°, and Sea-level, = 29.897
Highest Reading, corrected for Index error, on the 16th, = 30.404
Lowest Do. Do., on the 10th, = 29.320
Difference, or Monthly Range, = 1.084

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 11th, = 73.3
Lowest in Month, corrected for Index errors, on the 11th, = 33.9
Difference, or Monthly Range, = 39.4
"Corrected Mean" of all the Highest, (Col. 5), = 54.7
"Corrected Mean" of all the Lowest, (Col. 6), = 41.3
Difference, or Mean Daily Range, = 13.4
** Calculated Mean Temperature of Month, = 48.0
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 11th, = 73.3
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 73.3
Lowest at Night, Black Bulb, (corrected for Index errors), on the 11th, = 33.9
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 33.9
Difference of above Means or Range ("exposed"), = 39.4

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 48.2
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 44.8
Computed Temperature of Dew-Point, = 41.1
Do. Elastic Force of Vapour, = 257
Do. Weight of Vapour in a Cubic Foot of Air, = 294
Relative Humidity, (Saturation = 100), = 77
RAIN fell on 19 Days; Amount in Inches, = 0.97

WIND.	SUMMARY.											Mean Force.	Mean Velocity in miles per day.
	Direction.	N	NE	E	SE	S	SW	W	NW	Variable.	Calm or Variable.		
A.M.		2	8	2	1	5	5	4	4	0		1.15	
P.M.		3	6	0	2	2	3	3	4	8		0.73	
Mean.		2	7	1	2	4	4	3	4	4		0.94	0.88

Observations made and
Return verified by

James Dale Leacher
Robert Gordon College

(Signed)

Greatest Daily Range = 23.4 on the 24th

SCOTTISH METEOROLOGICAL SOCIETY.

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

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

During the MONTH of July 1883.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.				SEA.	OZONE.	GENERAL REMARKS.		Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer. No. —	No. of hours in which it fell.	9 A.M.		P.M.		9 h. A.M.		Temperature of WIND at depth of feet. No. —	Temperature at 1 foot, and Density.			0—10.	As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc.		Mention the hour at which Storms, including Thunder and Lightning, began and ended.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
		Barometer. * No. —	Attach- ed Ther- mometer	Barometer. No. —	Attach- ed Ther- mometer	Max. No. —	Min. No. —	Max. in Sun's rays No. —	Min. on Grass. No. —	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direc- tion.	Force	Direc- tion.	Force			9 h. A.M.	No. —	Amount (0—10), and Direction.	Amount, (0—10), and Species.	Velocity (0—10), and Direction.	Amount, (0—10), and Species.									No. —	12 inches.	No. —	22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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NOTATION USED IN GENERAL REMARKS.

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

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, “corrected Mean” at 9 A.M., minus the Correction†† = 29.883
for Temp. (Col. 2), = 29.955 — 0.072.

Corrected Mean of Barometer at 9 P.M., minus the Correction†† = 29.884
for Temp. (Col. 4), = 29.952 — 0.068.

Mean at Station, corrected, and at 32°, = 29.884

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

Mean, reduced to 32°, and Sea-level, = 29.958

Highest Reading, corrected for Index error, on the 3 th, = 30.340

Lowest Do. Do., on the 26 th, = 29.558

Difference, or **Monthly Range**, = 0.782

S.-R. THERMOMETER, (in shade, etc.), **Highest in Month**, (corrected for Index Errors), on the 30 th, = 69.5

Lowest in Month, corrected for Index errors, on the th, = 38.9

Difference, or **Monthly Range**, = 30.6

“Corrected Mean” of all the **Highest**, (Col. 5), = 60.0

“Corrected Mean” of all the **Lowest**, (Col. 6), = 46.8

Difference, or **Mean Daily Range**, = 13.2

** Calculated **Mean Temperature** of Month, = 53.4

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

“Corrected Mean,” (Col. 7), of **Black Bulb, Max. in Sun**, =

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

“Corrected Mean,” (Col. 8), of **Black Bulb, Min. on grass**, =

Difference of above Means or Range (“exposed”), =

HYGROMETER, **Mean** (corrected) A.M. and P.M. Reading of **Dry Bulb**, (Cols. 9 and 11), = 53.6

Mean (corrected) A.M. and P.M. Reading of **Wet Bulb**, (Cols. 10 and 12), = 49.9

†† Computed **Temperature of Dew-Point**, = 46.3

†† Do. **Elastic Force of Vapour**, = 3.13

†† Do. **Weight of Vapour in a Cubic Foot of Air**, ... = 3.52

†† **Relative Humidity**, (Saturation = 100), = 76

RAIN fell on // Days; **Amount in Inches**, = 1.14

WIND.		SUMMARY.		
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INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS

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

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

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

The Barometer originally constructed by Mr. Aitken of London, and usually called the Board of Trade Barometer, has the great convenience of requiring no adjustment of the cistern. Its scales are not true inches, but so much shorter as to compensate the error that would otherwise arise from the fluctuations of the surface of the mercury in the cistern. This is an excellent Barometer for ordinary Observers, inasmuch as it entirely eliminates the error of observation likely to arise in not a few cases in setting the instrument to the zero point of the fixed scale when the light is not good. To slow the accuracy with which these Barometers are made, it may be said, that one was compared, during a whole year, with the Society's Standard Barometer, particular care being given to make the comparison when atmospheric pressure was rising or falling very rapidly with the result that the difference of the readings differed from those of the Standard more than 0.003 inch.

The Society's Standard Barometer is used at a number of the Society's Stations, by which the cistern of the zero point with those of the fixed scale is indicated by a little ivory point, whose stem passes freely through the bit and base of the cistern. When the observer on his little piston and is brought by the adjusting screw to form one straight line with the ivory point, the surface of the mercury is then at the exact height of the ivory point, the scale is graduated. In taking an observation this preliminary setting must be made with scrupulous accuracy; as a slight error here will vitiate the readings from the vernier.

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

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

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

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

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

The Council of the Society recommend that the Self-Registering Thermometers, and the Dry and Wet Bulb Hygrometers, be kept in Stevenson's Louvre-boarded Box for Thermometers, painted white inside and outside, and served to four stout posts, also painted white, firmly fixed in the ground. The posts must be of such a length that when the Thermometers are hung in position, the Bulbs of the Minimum Thermometer, and of the Dry and Wet Bulb Thermometers will be exactly at the same height of four feet above the ground, the Maximum Thermometer being hung immediately above the Minimum Thermometer.

The Thermometer Box is to be placed over a plot of grass, and in a free open space to which the sun's rays have free access during as much of the day as surrounding conditions enable the Observer to secure. The Thermometers are suspended on cross laths in the centre of the box, and face the door, which should open to the north. The Council regard the question of *UNIFORMITY OF HEIGHT ABOVE GROUND, AND METHOD IN PROTECTING THE THERMOMETERS, AS VITAL* to every system of Meteorological Observation, since without it Observations made at different Stations are incomparable, thus rendering it impossible to compare the Climates of places with each other as regards their most important features.

Professor Phillips, and Negretti and Zambra's Maximum Thermometers, and Luthierford's Minimum Thermometer are recommended. It is recommended that these Thermometers be graduated on the glass stem. Minimum Thermometer is liable to two deceptions—viz., the column of spirit breaking, and part of the spirit distilling by high temperature and lodging at the top of the tube. This derangement is of occasional occurrence with Protected Thermometers, but of frequent occurrence with exposed Thermometers. Hence a systematic examination of Minimum Thermometers ought to be a regular part of the work carried on by each Observer.

Fortunately, Self-Registering Thermometers may be easily set right by any one, when the column of spirit chances to separate. Let the Thermometer be taken in the hand by the end farthest from the bulb, raised above the head, and then forcibly swung down towards the feet; the object being, on the principle of centrifugal force, to send down the detached portion of spirit till it unites with the column.

A few throws, or swinging strokes, will generally be sufficient for the purpose; after which the Thermometer should be placed in a slanting position, to allow the rest of the spirit still adhering to the sides of the tube to drain down to the column. But another method must be adopted, if the portion of spirit in the top of the tube be small. Heat should be applied slowly and cautiously to the top end of the tube where the detached portion of spirit is, which, being turned into vapor by the heat, will condense on the surface of the unbroken column of spirit. Care must be taken that the heat is not applied too quickly; for, if it be done, the tube will break and the instrument be destroyed. The best way to apply the requisite amount of heat, is by bringing the end of the tube slowly down towards a minute flame from a gas-burner; or, if gas be not at hand, a piece of heated metal will serve the purpose.

The Bulbs of the Thermometers for registering the greatest heat from the sun's rays, and the least from radiation during night, have a black coating, which may easily be made, or painted, the application of a mixture of lampblack and spirits of wine. They are placed in shallow blackened boxes, whose sides are painted black. The Maximum should be freely exposed to the sun, and the Minimum should rest on wood or plaster. Snow must be allowed to fall on the glass, and the Thermometers for the sake of the snow must be discoloured. Black-bulbs exposed in "glass jackets" may also be used, being indeed preferable to the observation of Solar and Terrestrial Radiation is not yet in a sufficiently advanced state to warrant the exclusive recommendation of any one of these methods.

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

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

The Hygrometer is read at 9 A.M. and 9 P.M. The Self-Registering Thermometers are read at 9 P.M. only, as indicating the temperature of 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, their extremes may occur at any hour; and it is necessary to refer their occurrence to their proper meteorological day. In the Society's schedules, the indications registered on the 3d are those of a series of phenomena commencing at 9 P.M. on the 24, and extending till 9 P.M. on the 3d.

No instrument ought to be used for Meteorological purposes till it has been carefully tested by comparison with a Standard Thermometer. When such Thermometers are used, as are not graduated on the stem, but merely on the bulb, they are not so accurate, and are very liable to be moved from their position on the Scale, and Self-Registering, especially the Minimum Thermometers, ought frequently to be compared with the dry bulb of the Hygrometer. The freezing-point of each Thermometer, marked by a scratch on the tube, ought to be tested once a year, in snow or melting ice.

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

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

Very great care should be bestowed on the Observations of the Wind. The accuracy of which, both as regards Direction and Force, is so essential towards the right discussion of many of the more important problems of the science. A Wind-Vane ought to be elevated at least 12 feet above surrounding objects. When it oscillates incessantly, the mean direction should be taken. In all cases, but especially when the Vane is stationary, and when the wind is feeble, reference may be made to the direction of smoke, etc., in well-exposed situations. Careful observations are recommended to be made on the changes in the direction of the wind; and during storms, extra observations at every hour of Greenwich time. Such a system of highly valuable and important results, particularly in connection with the system of thick-plaited Stations, in the limited district round Edinburgh called Storm Stations, in the course of being established by the Society for the systematic investigation of the relation of the force of the wind to Barometrical Gradations, and other points connected with storms.

The Council would recommend the Henslowian Cup Anemometer, a self-registering instrument which shows the amount of Wind that passes it per day; from which also the mean Velocity of the Wind at the time of observation may be ascertained. For indicating the direction of the wind, the Society's Anemometer, and Mr. R. Ballingall, the Society's Observer at Edinburgh, are recommended as likely to secure uniformity in making observations on the Force of the Wind.

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

Snow-falls may, for convenience, be registered in the rain columns, under the following conditions:—When a Snow-shovel is used, the depth of snow to 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 present, and recorded in addition to, and as a check upon, the indications of the Rain-Gauge. For wind, rain, and snow, as indicated in every column, the Observer cannot be too careful to register observations only; and nothing that partakes of the nature of deduction or observation for the non-fulfilment of Clouds will be found on the other side.

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

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

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

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

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

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

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

The Temperature of the water at the bottom of Wills ought, when practicable, to be taken, both the depth of the water, and of the water being noted.

Mention what Test-Papers are used, Schönbein's or Mofitt's, etc. The Paper is affixed by a pin to a board in the Thermometer Box, and the indications registered at 9 A.M. and 9 P.M. It is desired that these indications be registered in connection with the force and direction of the wind at the time of observation, in the following manner:—thus 3rd, as an Ozon entry in the schedule will indicate that the Ozon paper is tinted as 3 on the scale, that the wind is from the N.W., and that its force on the scale 0—5 is 4, or blowing fresh.

Too much importance cannot be attached to the electric condition of the atmosphere in connection with terrestrial magnetism, barometrical, thermometrical, and meteorological phenomena generally. A proper Electrometer is, in truth, necessary to every complete meteorological observatory. The Remarks column is unavoidably too narrow. Some of the most valuable Observations that can be taken are those for which no rules can be given nor hours assigned. The use of contractions, ought, therefore, to be taken every advantage of, and a list of such as are in general use are given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Precipitant 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, elevations, and fluctuations of the Barometer, Thunder-Storms, and remarkable falls of Snow, Hail, or Rain, the Hour of Storms of Wind commencing, attaining their maximum, and ending, as well as such notes on Storms as have been hinted at above. When lofty hills are in the vicinity of a Station, the Height of Clouds and of the Snow-line in winter should be recorded.

By the use of abbreviations, the state of the weather at 9 A.M. and 9 P.M. should be registered either in two columns, otherwise uncoupled, or ruled off for the purpose, from the column of Remarks. Observations in connection with the Periodic Return of the Seasons, possess not only great scientific value, but are of considerable importance in connection with Agriculture, Horticulture, and Natural History. The Council would direct the special attention of Observers to the registration of such phenomena, so that the published Summaries may fairly represent the whole of Scotland. Observations ought to be confined to individual trees and shrubs; to particular species of birds, and, in the case of crops, to specified sorts reared from year to year on a selected piece of ground or farm. The Annual Table, published yearly in the Society's Journal, will indicate the species of plants and animals to which special attention is more particularly directed.

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

(By Order)
Secretary, December 1883.

EDINBURGH.

Mr ALEXANDER BUCHAN,

Secretary of the Meteorological Society of Scotland,

ABERDEEN.

June 1883.

BOOK POST.

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

Observations in connection with the PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.

POSSIBLE TREES.

Barberry,

Broom,

Hazel,

Hawthorn,

Holly,

Laburnum,

Lilac,

Mazoeon,

Mountain Ash or Rowan,

Rail or Corn Crake,

Strawberry,

Plum,

Pear,

Peach,

Gooseberry,

Cherry,

Black Currant,

Apple,

Bouquet or Elder,

Barberry,

Broom,

Hazel,

Hawthorn,

Holly,

Laburnum,

Lilac,

Mazoeon,

Mountain Ash or Rowan,

Rail or Corn Crake,

Strawberry,

Plum,

Pear,

Peach,

Gooseberry,

Cherry,

Black Currant,

Apple,

Bouquet or Elder,

Barberry,

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Laburnum,

Lilac,

Mazoeon,

Mountain Ash or Rowan,

Rail or Corn Crake,

Strawberry,

Plum,

Pear,

Peach,

Gooseberry,

Cherry,

Black Currant,

Apple,

Bouquet or

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon College, County of Aberdeen, in Lat. 57°9'N, Long. 2°6'W, Distance from Sea 1 miles.Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 22 feet.During the MONTH of July 1883.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER.				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.	
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.	Amount in inches.	9 A.M.		9 P.M.		9 h. A.M.							
		Barometer. * No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	Max. No.	Min. No.	Max. in Sun/shade.	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.			9 h. A.M.	Velocity (0-10), and Direction.	Amount (0-10), and Species.	Velocity (0-10), and Direction.	Amount (0-10), and Species.	No. 3 inches.	No. 12 inches.					No. 22 inches.
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°						Speed.	Amount.	Speed.	Amount.	Hours.	°	°					°
1	29.934	61.3	29.976	61.8	71.1	53.8			67.5	61.4	61.0	58.1	S.W.	1	S.W.	1		—	cu-st	3	cu-st	6	14							1	
2	29.998	62.0	29.986	62.1	67.5	52.0			62.1	57.0	60.9	57.9	S.W.	1	—	—		.25	cu-st	8	cu-st	9	16							2	
3	29.976	60.4	29.992	60.5	65.1	53.5			61.3	59.0	57.1	56.0	—	—	—	—		.21	st	9	cu-st	9	5							3	
4	29.830	60.0	29.734	59.2	59.1	52.6			57.1	56.7	54.5	53.2	—	—	—	—		.83	st	10	st	10	—							4	
5	29.746	61.8	29.788	61.5	66.4	55.0			63.0	58.6	58.8	55.0	S.E.	1	S	1		—	cu	2	cu-st	8	10							5	
6	29.772	60.0	29.706	60.5	67.4	57.8			59.9	56.0	56.5	55.0	S.W.	1	S	1		—	cu-st	3	cu-st	5	12							6	
7	29.712	61.9	29.742	60.7	69.0	54.1			63.0	59.2	58.2	55.8	S	1	S	1		.21	cu-st	8	cu-st	9	10							7	
8	29.678	61.6	29.746	63.4	74.0	53.3			62.9	60.0	61.0	58.5	S.W.	1	S.W.	1		.17	cu	4	cu-st	2	14							8	
9	29.658	60.8	29.686	60.9	65.9	54.5			61.1	59.8	58.5	55.6	S.E.	1	—	—		.02	cu-st	9	st	10	6							9	
10	29.698	61.4	29.682	60.9	64.4	54.5			58.8	56.2	58.8	55.0	N	1	S.W.	1		.05	cu	8	cu-st	9	4							10	
11	29.462	61.5	29.508	60.6	63.0	54.8			62.6	57.8	55.8	53.6	S	1	S.W.	1		.02	cu	5	cu	3	6							11	
12	29.184	60.5	29.186	60.5	61.5	52.0			59.0	58.9	57.5	55.2	S.W.	1	S.E.	1		.13	nm.	10	cu-st	9	4							12	
13	29.464	59.5	29.666	58.0	61.1	50.8			57.2	52.4	52.0	50.6	N	1	—	—		.39	nm.	9	nm.	10	2							13	
14	29.722	58.2	29.742	57.8	53.0	47.6			54.0	50.7	51.0	49.2	N.W.	1	N.W.	1		.13	cu-st	10	cu-st	10	2							14	
15	29.744	56.2	29.838	58.6	62.6	44.5			55.0	47.8	52.0	49.0	N	1	S.E.	1		.01	cu	2	cu-st	8	12							15	
16	29.856	58.8	29.824	58.5	62.2	50.0			56.6	52.0	55.0	52.2	N.W.	1	N.W.	1		.01	cu-st	9	cu-st	9	6							16	
17	29.694	58.2	29.754	57.5	61.5	48.2			57.4	53.2	52.0	50.5	N	1	N	1		.29	cu-st	6	cu-st	8	6							17	
18	29.842	57.8	29.778	58.2	57.2	49.6			58.1	54.6	53.6	51.8	N	1	E	1		.02	cu-st	8	cu-st	8	4							18	
19	29.746	58.6	29.748	57.3	60.5	47.2			57.4	50.6	54.2	49.0	N	1	—	—		.02	cu-st	9	cu-st	10	8							19	
20	29.734	58.9	29.746	58.9	59.0	48.5			56.5	50.6	53.4	49.5	N	1	—	—		—	cu-st	9	cu-st	8	5							20	
21	29.686	57.2	29.640	57.2	61.0	49.0			56.2	51.6	54.8	52.5	E	1	N.E.	1		.96	st	10	st	10	5							21	
22	29.898	55.8	29.834	58.8	59.0	47.3			52.4	50.8	49.0	46.5	N	1	N.W.	3		.11	st	10	st	10	2							22	
23	29.580	55.5	29.622	56.6	64.4	47.8			53.4	51.9	52.6	51.0	N.W.	1	—	—		.28	st	10	st	8	—							23	
24	29.698	58.0	29.682	58.9	57.2	48.5			55.0	52.2	54.6	52.5	N.W.	1	—	—		.19	st	10	st	9	—							24	
25	29.828	57.2	29.982	57.0	69.2	49.5			57.2	53.6	52.5	52.2	N	1	S	1		.06	nm.	9	—	—	6							25	
26	30.106	58.0	30.184	67.8	63.8	50.0			57.5	52.9	52.0	52.2	N	1	N	1		—	cu	5	cu-st	2	16							26	
27	30.278	58.8	30.244	63.5	57.2	51.0			55.1	52.0	52.3	48.6	N	1	N	1		—	st	10	cu-st	9	—							27	
28	30.126	55.7	30.048	58.0	57.0	50.2			52.6	50.5	52.0	48.2	N	1	N	1		—	st	10	cu-st	9	4							28	
29	29.828	55.8	29.896	57.0	60.0	48.5			54.0	49.2	52.9	51.1	N	1	—	—		—	cu-st	10	cu-st	10	2							29	
30	29.622	56.5	29.634	57.3	54.0	48.5			53.2	52.8	54.5	53.8	N	1	N	1		—	st	10	st	8	2							30	
31	29.684	57.6	29.722	57.8	61.0	52.7			57.6	54.5	55.6	52.5	S.W.	1	S.W.	1		—	cu-st	10	cu-st	4	6							31	
Sums.	2017.15	16.14	2017.14	15.14	15.7	15.12			17.9	13.4	13.1	15.10			7	8		8													
Means.	23.464	264.5	23.616	260.8	87.3	23.2			258.6	133.5	156.3	81.6			26.0	16.0		21.26		24.5		23.9	18.9								
+ Total Corrections for Instrumental Errors.	29.757	58.5	29.762	58.4	62.8	50.7			58.3	54.3	55.0	52.6			0.84	0.52			7.9		7.7										
+ Corrections for Diurnal Range.	+0.006	-0.8	+0.006	-0.8	-0.5	-0.2			-0.2	-0.4	-0.2	-0.2																			
"Corrected Means."	29.763	57.7	29.768	57.6	62.3	50.5			58.1	53.9	54.8	52.4																			
No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction^{††} for Temp. (Col. 2), = 29.685
Corrected Mean^{*} of Barometer at 9 P.M., minus the Correction^{††} for Temp. (Col. 4), = 29.690
Mean at Station, corrected, and at 32°, = 29.688
Correction for height, 66 feet above Mean Sea-level, = .074
Mean, reduced to 32°, and Sea-level, = 29.762
Highest Reading, corrected for Index error, on the th, = 30.278
Lowest Do. Do., on the th, = 29.184
Difference, or Monthly Range, = 1.094

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

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the th, = 73.5
Lowest in Month, corrected for Index errors, on the th, = 44.3
Difference, or Monthly Range, = 29.2
"Corrected Mean" of all the Highest, (Col. 5), = 62.3
"Corrected Mean" of all the Lowest, (Col. 6), = 50.5
Difference, or Mean Daily Range, = 11.8
** Calculated Mean Temperature of Month, = 56.4

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

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 56.4
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 53.2
†† Computed Temperature of Dew-Point, = 50.2
†† Do. Elastic Force of Vapour, = .365
†† Do. Weight of Vapour in a Cubic Foot of Air, =
†† Relative Humidity, (Saturation = 100), = 80
RAIN fell on 21 Days; Amount in Inches, = 4.26

WIND.												SUMMARY.		
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.			
A.M.	10	0	1	2	2	6	3	4	02	0.84				
P.M.	3	1	1	2	4	5	2	3	10	0.52				
Mean.	7	1	1	2	3	5	3	3	6	0.68				

Observations made and
Return verified by

Margaret Dale

(Signed)

James Dale

H.R.

H.R.

6.08

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Cornton College, County of Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.
Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2 1/2 feet. During the MONTH of August 1883.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. <i>Mention the hour at which Storms, including Thunder and Lightning, began and ended.</i>	Days of Month.			
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.	Amount in inches.	9 A.M.		P.M.		9 h. A.M.									
		Barometer. * No. —	At- tached Ther- mometer	Barometer. No. —	At- tached Ther- mometer	Max. No. —	Min. No. —	Max. in Sun's rays No. —	Min. on Grass. No. —	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direc- tion.	Force	Direc- tion.	Force			9 h. A.M.	No.	Velocity (0—10), and Direc- tion.	Amount (0—10), and Species.	Velocity (0—10), and Direc- tion.	Amount (0—10), and Species.	No.					3 inches.	12 inches.	22 inches.
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°																			
1	29.848	58.0	29.944	58.6	67.5	57.5			58.8	52.0	58.0	56.0	S.W.	2	—	—	—	—	St.	10	Ca-st	4	14				1						
2	30.096	59.5	30.140	58.6	61.0	52.4			60.8	58.0	56.4	54.0	W	1	—	—	47	—	Ca-st	10	Ca-ca	5	13				2						
3	30.210	58.0	30.184	57.8	63.0	52.6			57.6	53.8	53.0	53.5	N.W.	2	S.W.	2	—	—	Ca-st	8	Ca	4	8				3						
4	30.066	59.8	29.986	60.4	69.3	53.6			59.8	51.5	58.5	58.0	S.W.	1	S.W.	2	—	—	Ca-st	10	Ca	3	10				4						
5	29.966	59.3	29.986	59.8	66.1	57.5			64.1	56.3	57.2	52.6	W	2	—	—	—	—	Ca.	3	Ca-st	8	8				5						
6	29.936	58.0	29.852	56.4	61.4	50.0			56.4	52.0	55.0	53.2	N.W.	2	S	1	—	—	Ca-st	5	Ca-st	10	10				6						
7	29.840	58.0	29.700	59.0	64.1	44.6			59.3	54.0	54.3	52.8	W	1	—	—	24	—	Ca-st	8	Ca-st	6	8				7						
8	29.436	57.0	29.206	58.2	62.8	44.1			53.0	52.0	54.0	48.8	S.	2	W.	1	07	—	Nom	10	Ca	2	6				8						
9	29.048	56.0	29.044	53.0	69.4	45.8			53.8	49.0	51.7	44.1	S.W.	2	N.W.	2	23	—	St	10	Ca-st	8	4				9						
10	29.044	57.0	29.400	57.0	69.0	50.1			55.2	52.7	53.5	50.4	N.	2	N.W.	1 1/2	21	—	Ca	8	Ca-st	3	10				10						
11	29.636	58.0	29.836	58.5	63.1	50.0			59.0	53.4	52.2	49.0	N.W.	2	N.W.	1	—	—	Ca	10	St	1	12				11						
12	30.066	58.0	29.958	57.5	62.2	46.0			58.8	52.0	57.1	51.8	N.W.	2	N.W.	1	44	—	Ca-st	9	Ca	10	6				12						
13	29.840	57.0	29.648	56.5	55.0	47.8			53.4	52.8	54.6	54.0	S.E.	1 1/2	S.E.	2	52	—	Nom	10	Nom	10	—				13						
14	29.486	62.0	29.338	58.6	67.0	58.5			62.3	59.0	57.2	55.0	S.W.	1 1/2	S.W.	1	11	—	Ca	4	St	10	—				14						
15	29.348	57.4	29.630	57.0	58.0	50.8			55.1	53.1	52.0	50.4	N.W.	1 1/2	N.W.	2 1/2	08	—	Ca-st	8	St	10	—				15						
16	29.880	56.5	29.942	57.5	62.0	47.5			53.0	48.0	53.1	50.2	N.W.	2	—	—	—	—	Ca-st	5	St	10	12				16						
17	29.886	56.6	29.812	59.2	65.0	50.2			56.0	53.8	59.0	56.4	S.W.	1	—	—	—	—	St	10	Cor.	5	10				17						
18	29.966	59.5	30.014	59.5	65.6	46.1			59.0	54.0	57.6	54.8	W	1 1/2	N.W.	1	—	—	Ca	8	Ca	5	12				18						
19	30.170	59.0	30.200	59.0	68.2	50.2			61.0	53.2	58.0	58.2	S.W.	2	S.W.	2	—	—	Ca	5	—	—	14				19						
20	30.074	59.0	29.924	59.0	60.2	52.0			58.0	58.4	58.0	56.1	S.W.	1	W	1 1/2	—	—	Ca-st	9	St	10	10				20						
21	30.110	61.0	30.134	57.8	66.8	54.0			62.0	56.8	56.0	54.6	S.W.	1	S.W.	2	—	—	Ca	3	St	10	14				21						
22	30.160	59.5	30.174	61.0	63.6	51.0			58.9	54.4	58.5	54.3	S.E.	2	—	—	—	—	Ca	4	St	1	14				22						
23	30.232	59.0	30.240	59.4	63.0	50.0			58.0	54.6	56.0	54.2	—	—	W.	2	08	—	Cor	2	St	8	10				23						
24	30.184	59.0	30.172	59.4	69.2	52.8			58.2	56.0	62.0	59.9	—	—	—	—	06	—	St	10	St	3	6				24						
25	30.088	67.0	30.020	64.2	71.8	51.9			60.2	60.1	61.2	58.7	W.	1	—	—	07	—	St	2	St	3	12				25						
26	29.880	62.0	29.844	62.0	67.0	56.5			61.2	58.2	60.5	56.8	W	1 1/2	S.W.	2	22	—	Ca	4	Ca-st	4	10				26						
27	29.688	64.5	29.736	59.4	60.2	50.0			64.2	59.3	57.7	55.0	W.	2	—	—	—	—	Ca	2	Ca-st	9	10				27						
28	29.792	61.0	29.892	60.0	60.8	51.6			57.8	52.0	53.2	52.2	W	2	—	—	42	—	Ca-st	9	Nom	10	4				28						
29	29.708	58.0	29.808	59.0	60.2	49.8			53.2	50.2	53.2	50.8	N.E.	2 1/2	N.E.	2	—	—	Ca	8	St	10	12				29						
30	29.698	57.0	29.466	59.5	67.0	57.8			55.2	53.2	56.5	54.9	N.	2	N	1	—	—	St	10	—	—	3				30						
31	29.572	57.5	29.536	58.5	66.2	47.8			57.0	53.0	53.9	52.2	N.W.	2 1/2	S.W.	2	33	—	St	4	Ca-st	10	10				31						
Sums.	41813	225	16124	220	137	1212			179	137	168	1411		8		6		6															
Means.	29.837		29.829	58.7	63.5	51.1			58.2	54.0	56.2	53.6		1.10		0.61				7.0	6.2												
† Total Corrections for Instru- mental Errors.	+0.000	-0.8	+0.000	-0.8	-0.5	-0.1			-0.2	-0.3	-0.2	-0.3									6.6												
† Correc- tions for Diurnal Range.																																	
"Cor- rected Means."	29.843		29.835	57.9	63.0	51.0			58.0	53.7	56.0	53.3																					
No. of Column.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			

NOTATION USED IN GENERAL REMARKS.

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

TABLE FOR ESTIMATING FORCE OF WIND.

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

NOTATION USED IN GENERAL REMARKS.

a.	denotes aurora.	m.	denotes meteor.
ci.	" cirrus.	ms.	" meteors.
ci-cu.	" cirro-cumulus.	n.	" nimbus.
ci-s.	" cirro-stratus.	r.	" rain.
cu.	" cumulus.	h.r.	" heavy rain.
cu-s.	" cumulo-stratus.	c. h. r.	" continued heavy rain.
d.	" dew.	s.	" stratus.
f.	" fog.	sc.	" scud.
fr.	" frost.	s.	" sleet.
h. fr.	" hoar-frost.	so. ha.	" solar halo.
h.	" haze.	sq.	" squall.
h. d.	" heavy dew.	sgs.	" squalls.
hl.	" hail.	t.	" thunder.
l.	" lightning.	t. s.	" thunder storm.
li. cl.	" light clouds.	w.	" wind.
li. sh.	" light showers.	5°	" gale of wind.
lu. co.	" lunar corona.		
lu. ha.	" lunar halo.		

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction†† = 29.775
for Temp. (Col. 2), = 29.775 — 0.080 = 29.695
Corrected Mean" of Barometer at 9 P.M., minus the Correction†† = 29.756
for Temp. (Col. 4), = 29.756 — 0.077 = 29.679
Mean at Station, corrected, and at 32°, 29.760 = 29.760
Correction for height, 66 feet above Mean Sea-level, = 0.074
Mean, reduced to 32°, and Sea-level, 29.834 = 29.834
Highest Reading, corrected for Index error, on the 23th, = 30.244
Lowest Do. Do., on the 9th, = 29.044
Difference, or Monthly Range, 1.200 = 1.200

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 25th, = 71.3
Lowest in Month, corrected for Index errors, on the 11th, = 45.0
Difference, or Monthly Range, = 26.3
"Corrected Mean" of all the Highest, (Col. 5), = 63.0
"Corrected Mean" of all the Lowest, (Col. 6), = 51.0
Difference, or Mean Daily Range, = 12.0
** Calculated Mean Temperature of Month, = 57.0
S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 11th, = 71.3
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun, = 71.3
Lowest at Night, Black Bulb, (corrected for Index errors), on the 11th, = 45.0
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass, = 51.0
Difference of above Means or Range ("exposed"), = 26.3

G.S. Range, on the 18th = 20.12

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 57.0
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 53.5
†† Computed Temperature of Dew-Point, = 50.2
†† Do. Elastic Force of Vapour, = 364
†† Do. Weight of Vapour in a Cubic Foot of Air, = 4.05
†† Relative Humidity, (Saturation = 100), = 78
RAIN fell on 15 Days; Amount in Inches, = 3.85

WIND.	SUMMARY.									
	Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.
A.M.		2	1	0	2	1	8	8	7	2
P.M.		1	1	0	1	1	7	3	6	11
Mean.		1	1	0	2	1	7	6	7	6

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

(Signed)

668
732

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon College, Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2 1/2 feet.During the MONTH of September 1883.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.				SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. <i>Mention the hour at which Storms, including Thunder and Lightning, began and ended.</i>	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		9 h. A.M.		9 h. P.M.		Protected in Shade, feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer. No. —		No. of hours in which it fell.	Amount in inches.	9 A.M.		P.M.		9 h. A.M.						Temperature of WELL at each of times, No. —	Temperature of Air, at each of times, No. —	9 A.M.	9 P.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		Barometer. * No. —	Attach- ed Ther- mometer	Barometer. No. —	Attach- ed Ther- mometer	Max. No. —	Min. No. —	Max. in Sun's rays No. —	Min. on Grass. No. —	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direc- tion.	Force	Direc- tion.	Force	9 h. A.M.	Species			Amt.	Species	Amt.	No. 8 inches.	12 inches.	No. 22 inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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BAROMETER, "corrected Mean" at 9 A.M., minus the Correction† = 29.703
for Temp. (Col. 2), = 29.774..... = 0.071.....
Corrected Mean" of Barometer at 9 P.M., minus the Correction† = 29.723
for Temp. (Col. 4), = 29.796..... = 0.073.....
Mean at Station, corrected, and at 32°..... = 29.713
Correction for height, 66 feet above Mean Sea-level,..... = 0.074
Mean, reduced to 32°, and Sea-level,..... = 29.787
Highest Reading, corrected for Index error, on the 13th,..... = 30.332
Lowest Do. Do., on the 13th,..... = 29.958
Difference, or Monthly Range,..... = 1.374

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the 13th,..... = 64.8
Lowest in Month, corrected for Index errors, on the 13th,..... = 35.1
Difference, or Monthly Range,..... = 29.7
"Corrected Mean" of all the Highest, (Col. 5),..... = 58.5
"Corrected Mean" of all the Lowest, (Col. 6),..... = 46.2
Difference, or Mean Daily Range,..... = 12.3
** Calculated Mean Temperature of Month,..... = 52.4

S.-R. THERMOMETER, Black Bulb in Sun, Highest, (corrected for Index Errors), on the 13th,..... =
"Corrected Mean," (Col. 7), of Black Bulb, Max. in Sun,..... =
Lowest at Night, Black Bulb, (corrected for Index errors), on the 13th,..... =
"Corrected Mean," (Col. 8), of Black Bulb, Min. on grass,..... =
Difference of above Means or Range ("exposed"),..... =

G.S. Range on the 12th 21.9

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11),..... = 52.6

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12),..... = 50.4

† Computed Temperature of Dew-Point,..... = 48.2

† Do. Elastic Force of Vapour,..... = 3.38

† Do. Weight of Vapour in a Cubic Foot of Air, ... = 3.80

† Relative Humidity, (Saturation = 100),..... = 85

RAIN fell on 21 Days; Amount in Inches,..... = 2.96

WIND.		SUMMARY.									
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	6	1	2	6	2	4	2	5	2	0.97	
P.M.	5	1	2	0	3	3	2	3	11	0.68	
Mean.	5	1	2	3	3	4	2	4	6	0.78	= 0.61

(Signed)

Observations made and
Return verified byJames Dale, Teacher
Rob. Gordon College - AberdeenMA.

SCOTTISH METEOROLOGICAL SOCIETY.

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

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

During the MONTH of OCTOBER 1888

The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER, "corrected Mean" at 9 A.M., <i>minus</i> the Correction $\uparrow\uparrow$	=	29.718
for Temp. (Col. 2), = 29.778..... - .060		
Corrected Mean" of Barometer at 9 P.M., <i>minus</i> the Correction $\uparrow\uparrow$	=	29.743
for Temp. (Col. 4), = 29.802..... - .059		
Mean at Station, corrected, and at 32°,.....	=	29.730
Correction for height, feet above Mean Sea-level,.....	=	.074
Mean, reduced to 32°, and Sea-level,.....	=	29.804
Highest Reading, corrected for Index error, on the th,.....	=	30.410
Lowest Do. Do., on the th,.....	=	28.900
Difference, or Monthly Range,.....	=	1.510

S. R. THERMOMETER, (in shade, etc.), **Highest in Month**, (corrected for Index Errors), on the th, = 74.3

Lowest in Month, corrected for Index errors, on the th, = 30.9

Difference, or **Monthly Range**, = 43.4

“ Corrected **Mean** ” of all the **Highest**, (Col. 5), = 53.9

“ Corrected **Mean** ” of all the **Lowest**, (Col. 6), = 41.1

Difference, or **Mean Daily Range**, = 12.8

** Calculated **Mean Temperature** of Month, = 47.5

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

HYGROMETER, Mean (corrected)—A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11),	= 47.2
Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12),	= 44.6
† Computed Temperature of Dew-Point ,	= 41.7
† Do. Elastic Force of Vapour ,	= .2
† Do. Weight of Vapour in a Cubic Foot of Air , ..	= 3.0
† Relative Humidity , (Saturation = 100),	= 82
RAIN fell on / 2 Days; Amount in Inches,	= 2.05

WIND.		SUMMARY.									
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	7	0	0	0	3	5	10	5	1	1.13	
P.M.	2	0	0	0	3	6	7	5	8	0.84	
Mean.	5	0	0	0	3	5	8	5	5	0.75 = 0.90	

Observations made and } James Dale, Teacher
Return verified by } Gordon's College, Abdu

(Signed)

~~784~~
~~412~~
 362

H. R.
~~475~~
~~855~~
~~905~~

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

Bradford

Oct 1883

To

Mr ALEXANDER BUCHAN,

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

BOOK POST.

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

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

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

The Barometer originally constructed by Mr. Adie of London, and usually called the Board of Trade Barometer, has 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 is an excellent Barometer for ordinary Observers, inasmuch as it entirely eliminates the error of observation likely to arise in not a few cases in setting the instrument to the zero point of the fixed scale when the light is not good. To allow the accuracy with which these Barometers are made, it may be stated, that one was compared, during a whole year, with the Society's Standard Barometer, particular care being given to make the comparison when atmospheric pressure was rising or falling very rapidly, with the result that none of the readings differed from those of the Standard more than 0.003 inch.

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

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

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

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

The Barometer is usually made 10.500 inch; that is to say, it shows 10.500 inch, when the pressure is 30.000 inches. Instead of 29.965 inches, 28.865 inches, 29.865 inches, or 29.815 inches. Barometers having two of these ivory bars, Observers must take these mistakes, particular attention is directed to the matter. When a Barometer having adjustable surfaces has to be used, from its fastenings, the ivory adjustment must be screwed so as to form a tight plug to the cistern, thus preventing the escape of the air, but within a quarter of an inch of the top of the tube, but by then screwing up the mercury up quite to the top of the tube, and having the Barometer for use, it must be ascertained whether the space above the mercury in the tube is a complete vacuum; this is the case if, on inclining the instrument, a sharp tap is produced when the mercury strikes the top of the tube. If a dull tap is heard, there is air in the tube, which must be got rid of.

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

The Council of the Society recommend that the Self-Registering Thermometers, and the Dry and Wet Bulb Hygrometers, be kept in Stevenson's Louvre-boarded Box for Thermometers, painted white inside and outside, and the Hygrometers served to four stout posts, also painted white, firmly fixed in the ground. The posts must be of such a length that when the Thermometers are hung in position, the Bulbs of the Minimum Thermometer, and of the Dry and Wet Bulb Thermometers will be exactly at the same height of four ears above the ground, the Maximum Thermometer being hung immediately above the Minimum Thermometer. The Thermometer box is to be placed over a plot of grass, and in a free open space to which the sun's rays have free access during as much of the day as surrounding conditions enable the Observer to secure. The Thermometers are suspended on cross-laths in the centre of the box, and face the door, which should open to the north. The Council regard the question of uniformity or heterogeneity of ground, AND METHOD IN PROTECTING THE THERMOMETERS, as vital in every system of Meteorological Observation, since without it observations made at different Stations are incomparable, thus rendering it impossible to compare the climates of places with each other as regards their most important features.

Professor Phillips, and Negretti and Zambra's Maximum Thermometers, and other instruments, are recommended. It is recommended that these Maximum Thermometers be graduated on the glass stem. The Minimum Thermometer is liable to two demerits—viz., the column of spirit breaking, and part of the tube, being turned into vapour by the heat, which must be taken that the heat is not applied too quickly; for, if this be done, the tube will break and the instrument be destroyed. The best way to apply the requisite amount of heat, is by bringing the end of the tube slowly down towards a minute flame from a gas-burner; or, if gas be not at hand, a piece of heated metal will serve instead.

The bulbs of the Thermometers for registering the greatest heat from the sun's rays, and the least from radiation during night, have a black coating, which may easily be made, or mended, by the application of a mixture of lampblack and printer's ink. They are placed in shallow blackened boxes, whose sides protect the bulbs from the wind. The Maximum should 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. Black-bulbs enclosed in 'glass jackets' may also be used, being indeed preferable to the above. It must, however, be added, that the whole subject of the observation of Solar and Terrestrial Radiation is not yet in a sufficiently advanced state to warrant the exclusive recommendation of any one of these methods.

The Hygrometer in use at the Society's Stations consists of two Thermometers usually, but not necessarily, mounted on one frame. As apparently slight deviations from the approved form of this apparatus seriously vitiate the Hygrometrical Observations, Observers are specially requested to attend to the following conditions:—The bulbs 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 a uniform temperature, it is evident that the best position is that which is least liable to sudden changes of temperature.

In reading the Thermometer great care must be taken to bring the eye exactly opposite the tip of the index or to the lens of a degree, and not to the middle of the scale. The Thermometer will read 39.9; 40.0; 40.1; or again, 40.4; 40.5; 40.6; according as the index is indicated by the 40.4; 40.5; 40.6; or a little over 40; or 40.3; 40.2; 40.1; or 40.0; or 39.9; or less must be registered. But from 40.2; 40.3; 40.4; 40.5; 40.6; 40.7; 40.8; 40.9; 41.0; 41.1; 41.2; 41.3; 41.4; 41.5; 41.6; 41.7; 41.8; 41.9; 42.0; 42.1; 42.2; 42.3; 42.4; 42.5; 42.6; 42.7; 42.8; 42.9; 43.0; 43.1; 43.2; 43.3; 43.4; 43.5; 43.6; 43.7; 43.8; 43.9; 44.0; 44.1; 44.2; 44.3; 44.4; 44.5; 44.6; 44.7; 44.8; 44.9; 45.0; 45.1; 45.2; 45.3; 45.4; 45.5; 45.6; 45.7; 45.8; 45.9; 46.0; 46.1; 46.2; 46.3; 46.4; 46.5; 46.6; 46.7; 46.8; 46.9; 47.0; 47.1; 47.2; 47.3; 47.4; 47.5; 47.6; 47.7; 47.8; 47.9; 48.0; 48.1; 48.2; 48.3; 48.4; 48.5; 48.6; 48.7; 48.8; 48.9; 49.0; 49.1; 49.2; 49.3; 49.4; 49.5; 49.6; 49.7; 49.8; 49.9; 50.0; 50.1; 50.2; 50.3; 50.4; 50.5; 50.6; 50.7; 50.8; 50.9; 51.0; 51.1; 51.2; 51.3; 51.4; 51.5; 51.6; 51.7; 51.8; 51.9; 52.0; 52.1; 52.2; 52.3; 52.4; 52.5; 52.6; 52.7; 52.8; 52.9; 53.0; 53.1; 53.2; 53.3; 53.4; 53.5; 53.6; 53.7; 53.8; 53.9; 54.0; 54.1; 54.2; 54.3; 54.4; 54.5; 54.6; 54.7; 54.8; 54.9; 55.0; 55.1; 55.2; 55.3; 55.4; 55.5; 55.6; 55.7; 55.8; 55.9; 56.0; 56.1; 56.2; 56.3; 56.4; 56.5; 56.6; 56.7; 56.8; 56.9; 57.0; 57.1; 57.2; 57.3; 57.4; 57.5; 57.6; 57.7; 57.8; 57.9; 58.0; 58.1; 58.2; 58.3; 58.4; 58.5; 58.6; 58.7; 58.8; 58.9; 59.0; 59.1; 59.2; 59.3; 59.4; 59.5; 59.6; 59.7; 59.8; 59.9; 60.0; 60.1; 60.2; 60.3; 60.4; 60.5; 60.6; 60.7; 60.8; 60.9; 61.0; 61.1; 61.2; 61.3; 61.4; 61.5; 61.6; 61.7; 61.8; 61.9; 62.0; 62.1; 62.2; 62.3; 62.4; 62.5; 62.6; 62.7; 62.8; 62.9; 63.0; 63.1; 63.2; 63.3; 63.4; 63.5; 63.6; 63.7; 63.8; 63.9; 64.0; 64.1; 64.2; 64.3; 64.4; 64.5; 64.6; 64.7; 64.8; 64.9; 65.0; 65.1; 65.2; 65.3; 65.4; 65.5; 65.6; 65.7; 65.8; 65.9; 66.0; 66.1; 66.2; 66.3; 66.4; 66.5; 66.6; 66.7; 66.8; 66.9; 67.0; 67.1; 67.2; 67.3; 67.4; 67.5; 67.6; 67.7; 67.8; 67.9; 68.0; 68.1; 68.2; 68.3; 68.4; 68.5; 68.6; 68.7; 68.8; 68.9; 69.0; 69.1; 69.2; 69.3; 69.4; 69.5; 69.6; 69.7; 69.8; 69.9; 70.0; 70.1; 70.2; 70.3; 70.4; 70.5; 70.6; 70.7; 70.8; 70.9; 71.0; 71.1; 71.2; 71.3; 71.4; 71.5; 71.6; 71.7; 71.8; 71.9; 72.0; 72.1; 72.2; 72.3; 72.4; 72.5; 72.6; 72.7; 72.8; 72.9; 73.0; 73.1; 73.2; 73.3; 73.4; 73.5; 73.6; 73.7; 73.8; 73.9; 74.0; 74.1; 74.2; 74.3; 74.4; 74.5; 74.6; 74.7; 74.8; 74.9; 75.0; 75.1; 75.2; 75.3; 75.4; 75.5; 75.6; 75.7; 75.8; 75.9; 76.0; 76.1; 76.2; 76.3; 76.4; 76.5; 76.6; 76.7; 76.8; 76.9; 77.0; 77.1; 77.2; 77.3; 77.4; 77.5; 77.6; 77.7; 77.8; 77.9; 78.0; 78.1; 78.2; 78.3; 78.4; 78.5; 78.6; 78.7; 78.8; 78.9; 79.0; 79.1; 79.2; 79.3; 79.4; 79.5; 79.6; 79.7; 79.8; 79.9; 80.0; 80.1; 80.2; 80.3; 80.4; 80.5; 80.6; 80.7; 80.8; 80.9; 81.0; 81.1; 81.2; 81.3; 81.4; 81.5; 81.6; 81.7; 81.8; 81.9; 82.0; 82.1; 82.2; 82.3; 82.4; 82.5; 82.6; 82.7; 82.8; 82.9; 83.0; 83.1; 83.2; 83.3; 83.4; 83.5; 83.6; 83.7; 83.8; 83.9; 84.0; 84.1; 84.2; 84.3; 84.4; 84.5; 84.6; 84.7; 84.8; 84.9; 85.0; 85.1; 85.2; 85.3; 85.4; 85.5; 85.6; 85.7; 85.8; 85.9; 86.0; 86.1; 86.2; 86.3; 86.4; 86.5; 86.6; 86.7; 86.8; 86.9; 87.0; 87.1; 87.2; 87.3; 87.4; 87.5; 87.6; 87.7; 87.8; 87.9; 88.0; 88.1; 88.2; 88.3; 88.4; 88.5; 88.6; 88.7; 88.8; 88.9; 89.0; 89.1; 89.2; 89.3; 89.4; 89.5; 89.6; 89.7; 89.8; 89.9; 90.0; 90.1; 90.2; 90.3; 90.4; 90.5; 90.6; 90.7; 90.8; 90.9; 91.0; 91.1; 91.2; 91.3; 91.4; 91.5; 91.6; 91.7; 91.8; 91.9; 92.0; 92.1; 92.2; 92.3; 92.4; 92.5; 92.6; 92.7; 92.8; 92.9; 93.0; 93.1; 93.2; 93.3; 93.4; 93.5; 93.6; 93.7; 93.8; 93.9; 94.0; 94.1; 94.2; 94.3; 94.4; 94.5; 94.6; 94.7; 94.8; 94.9; 95.0; 95.1; 95.2; 95.3; 95.4; 95.5; 95.6; 95.7; 95.8; 95.9; 96.0; 96.1; 96.2; 96.3; 96.4; 96.5; 96.6; 96.7; 96.8; 96.9; 97.0; 97.1; 97.2; 97.3; 97.4; 97.5; 97.6; 97.7; 97.8; 97.9; 98.0; 98.1; 98.2; 98.3; 98.4; 98.5; 98.6; 98.7; 98.8; 98.9; 99.0; 99.1; 99.2; 99.3; 99.4; 99.5; 99.6; 99.7; 99.8; 99.9; 100.0; 100.1; 100.2; 100.3; 100.4; 100.5; 100.6; 100.7; 100.8; 100.9; 101.0; 101.1; 101.2; 101.3; 101.4; 101.5; 101.6; 101.7; 101.8; 101.9; 102.0; 102.1; 102.2; 102.3; 102.4; 102.5; 102.6; 102.7; 102.8; 102.9; 103.0; 103.1; 103.2; 103.3; 103.4; 103.5; 103.6; 103.7; 103.8; 103.9; 104.0; 104.1; 104.2; 104.3; 104.4; 104.5; 104.6; 104.7; 104.8; 104.9; 105.0; 105.1; 105.2; 105.3; 105.4; 105.5; 105.6; 105.7; 105.8; 105.9; 106.0; 106.1; 106.2; 106.3; 106.4; 106.5; 106.6; 106.7; 106.8; 106.9; 107.0; 107.1; 107.2; 107.3; 107.4; 107.5; 107.6; 107.7; 107.8; 107.9; 108.0; 108.1; 108.2; 108.3; 108.4; 108.5; 108.6; 108.7; 108.8; 108.9; 109.0; 109.1; 109.2; 109.3; 109.4; 109.5; 109.6; 109.7; 109.8; 109.9; 110.0; 110.1; 110.2; 110.3; 110.4; 110.5; 110.6; 110.7; 110.8; 110.9; 111.0; 111.1; 111.2; 111.3; 111.4; 111.5; 111.6; 111.7; 111.8; 111.9; 112.0; 112.1; 112.2; 112.3; 112.4; 112.5; 112.6; 112.7; 112.8; 112.9; 113.0; 113.1; 113.2; 113.3; 113.4; 113.5; 113.6; 113.7; 113.8; 113.9; 114.0; 114.1; 114.2; 114.3; 114.4; 114.5; 114.6; 114.7; 114.8; 114.9; 115.0; 115.1; 115.2; 115.3; 115.4; 115.5; 115.6; 115.7; 115.8; 115.9; 116.0; 116.1; 116.2; 116.3; 116.4; 116.5; 116.6; 116.7; 116.8; 116.9; 117.0; 117.1; 117.2; 117.3; 117.4; 117.5; 117.6; 117.7; 117.8; 117.9; 118.0; 118.1; 118.2; 118.3; 118.4; 118.5; 118.6; 118.7; 118.8; 118.9; 119.0; 119.1; 119.2; 119.3; 119.4; 119.5; 119.6; 119.7; 119.8; 119.9; 120.0; 120.1; 120.2; 120.3; 120.4; 120.5; 120.6; 120.7; 120.8; 120.9; 121.0; 121.1; 121.2; 121.3; 121.4; 121.5; 121.6; 121.7; 121.8; 121.9; 122.0; 122.1; 122.2; 122.3; 122.4; 122.5; 122.6; 122.7; 122.8; 122.9; 123.0; 123.1; 123.2; 123.3; 123.4; 123.5; 123.6; 123.7; 123.8; 123.9; 124.0; 124.1; 124.2; 124.3; 124.4; 124.5; 124.6; 124.7; 124.8; 124.9; 125.0; 125.1; 125.2; 125.3; 125.4; 125.5; 125.6; 125.7; 125.8; 125.9; 126.0; 126.1; 126.2; 126.3; 126.4; 126.5; 126.6; 126.7; 126.8; 126.9; 127.0; 127.1; 127.2; 127.3; 127.4; 127.5; 127.6; 127.7; 127.8; 127.9; 128.0; 128.1; 128.2; 128.3; 128.4; 128.5; 128.6; 128.7; 128.8; 128.9; 129.0; 129.1; 129.2; 129.3; 129.4; 129.5; 129.6; 129.7; 129.8; 129.9; 130.0; 130.1; 130.2; 130.3; 130.4; 130.5; 130.6; 130.7; 130.8; 130.9; 131.0; 131.1; 131.2; 131.3; 131.4; 131.5; 131.6; 131.7; 131.8; 131.9; 132.0; 132.1; 132.2; 132.3; 132.4; 132.5; 132.6; 132.7; 132.8; 132.9; 133.0; 133.1; 133.2; 133.3; 133.4; 133.5; 133.6; 133.7; 133.8; 133.9; 134.0; 134.1; 134.2; 134.3; 134.4; 134.5; 134.6; 134.7; 134.8; 134.9; 135.0; 135.1; 135.2; 135.3; 135.4; 135.5; 135.6; 135.7; 135.8; 135.9; 136.0; 136.1; 136.2; 136.3; 136.4; 136.5; 136.6; 136.7; 136.8; 136.9; 137.0; 137.1; 137.2; 137.3; 137.4; 137.5; 137.6; 137.7; 137.8; 137.9; 138.0; 138.1; 138.2; 138.3; 138.4; 138.5; 138.6; 138.7; 138.8; 138.9; 139.0; 139.1; 139.2; 139.3; 139.4; 139.5; 139.6; 139.7; 139.8; 139.9; 140.0; 140.1; 140.2; 140.3; 140.4; 140.5; 140.6; 140.7; 140.8; 140.9; 141.0; 141.1; 141.2; 141.3; 141.4; 141.5; 141.6; 141.7; 141.8; 141.9; 142.0; 142.1; 142.2; 142.3; 142.4; 142.5; 142.6; 142.7; 142.8; 142.9; 143.0; 143.1; 143.2; 143.3; 143.4; 143.5; 143.6; 143.7; 143.8; 143.9; 144.0; 144.1; 144.2; 144.3; 144.4; 144.5; 144.6; 144.7; 144.8; 144.9; 145.0; 145.1; 145.2; 145.3; 145.4; 145.5; 145.6; 145.7; 145.8; 145.9; 146.0; 146.1; 146.2; 146.3; 146.4; 146.5; 146.6; 146.7; 146.8; 146.9; 147.0; 147.1; 147.2; 147.3; 147.4; 147.5; 147.6; 147.7; 147.8; 147.9; 148.0; 148.1; 148.2; 148.3; 148.4; 148.5; 148.6; 148.7; 148.8; 148.9; 149.0; 149.1; 149.2; 149.3; 149.4; 149.5; 149.6; 149.7; 149.8; 149.9; 150.0; 150.1; 150.2; 150.3; 150.4; 150.5; 150.6; 150.7; 150.8; 150.9; 151.0; 151.1; 151.2; 151.3; 151.4; 151.5; 151.6; 151.7; 151.8; 151.9; 152.0; 152.1; 152.2; 152.3; 152.4; 152.5; 152.6; 152.7; 152.8; 152.9; 153.0; 153.1; 153.2; 153.3; 153.4; 153.5; 153.6; 153.7; 153.8; 153.9; 154.0; 154.1; 154.2; 154.3; 154.4; 154.5; 154.6; 154.7; 154.8; 154.9; 155.0; 155.1; 155.2; 155.3; 155.4; 155.5; 155.6; 155.7; 155.8; 155.9; 156.0; 156.1; 156.2; 156.3; 156.4; 156.5; 156.6; 156.7; 156.8; 156.9; 157.0; 157.1; 157.2; 157.3; 157.4; 157.5; 157.6; 157.7; 157.8; 157.9; 158.0; 158.1; 158.2; 158.3; 158.4; 158.5; 158.6; 158.7; 158.8; 158.9; 159.0; 159.1; 159.2; 159.3; 159.4; 159.5; 159.6; 159.7; 159.8; 159.9; 160.0; 160.1; 160.2; 160.3; 160.4; 160.5; 160.6; 160.7; 160.8; 160.9; 161.0; 161.1; 161.2; 161.3; 161.4; 161.5; 161.6; 161.7; 161.8; 161.9; 162.0; 162.1; 162.2; 162.3; 162.4; 162.5; 162.6; 162.7; 162.8; 162.9; 163.0; 163.1; 163.2; 163.3; 163.4; 163.5; 163.6; 163.7; 163.8; 163.9; 164.0; 164.1; 164.2; 164.3; 164.4; 164.5; 164.6; 164.7; 164.8; 164.9; 165.0; 165.1; 165.2; 165.3; 165.4; 165.5; 165.6; 165.7; 165.8; 165.9; 166.0; 166.1; 166.2; 166.3; 166.4; 166.5; 166.6; 166.7; 166.8; 166.9; 167.0; 167.1; 167.2; 167.3; 167.4; 167.5; 167.6; 167.7; 167.8; 167.9; 168.0; 168.1; 168.2; 168.3; 168.4; 168.5; 168.6; 168.7; 168.8; 168.9; 169.0; 169.1; 169.2; 169.3; 169.4; 169.5; 169.6; 169.7; 169.8; 169.9; 170.0; 170.1; 170.2; 170.3; 170.4; 170.5; 170.6; 170.7; 170.8; 170.9; 171.0; 171.1; 171.2; 171.3; 171.4; 171.5; 171.6; 171.7; 171.8; 171.9; 172.0; 172.1; 172.2; 172.3; 172.4; 172.5; 172.6; 172.7; 172.8; 172.9; 173.0; 173.1; 173.2; 173.3; 173.4; 173.5; 173.6; 173.7; 173.8; 173.9; 174.0; 174.1; 174.2; 174.3; 174.4; 174.5; 174.6; 174.7; 174.8; 174.9; 175.0; 175.1; 175.2; 175.3; 175.4; 175.5; 175.6; 175.7; 175.8; 175.9; 176.0; 176.1; 176.2;

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 2 1/2 feet.During the MONTH of November 1888.

The Hours of Observation are of Greenwich Time.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.				CLOUDS.				THERMOMETERS under Ground.				SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.						
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		Readings of the H. Cup Anemometer. No. —		No. of hours in which it fell.	Amount in Inches.	9 A.M.		P.M.		SUNSHINE. Hours.	9 h. A.M.							Temperature of WELL at depth of feet. No.	Temperature at 1 fathom, and Drusky.	0 A.M., 9 P.M.			
		Barometer.	Attach- ed Ther- mometer	Barometer.	Attach- ed Ther- mometer	Max.	Min.	Max. in Sun's rays	Min. on Grass.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.	No. —	No. —			Velocity (0—10), and Species.	Amount (0—10), and Species.	Velocity (0—10), and Direction.	Amount (0—10), and Species.		No. —	No. —	No. —								No. —	No. —	No. —
		* No.	inches.	°	inches.	°	No.	No.	No.	No.	°	°	°	°					9 h. A.M.			No.	No.	°	°		°	°	°								°	°	°
	1	30.220	49.0	30.236	51.5	50.5	39.6			45.8	45.0	49.2	48.3																		1								
	2	30.052	51.0	29.918	52.0	51.0	45.1			49.2	48.2	47.0	45.2	W	1	W	1														2								
	3	29.816	54.0	29.884	52.0	53.6	40.8			51.4	47.2	43.0	40.0	SW	3	SW	1 1/2														3								
	4	29.200	52.0	29.196	50.0	51.8	39.5			49.1	47.8	46.0	38.0	W	3	W	1														4								
	5	29.112	49.0	29.198	49.5	49.5	38.7			44.0	40.1	40.0	37.2	W	2																5								
	6	29.242	46.0	29.326	43.0	46.2	32.5			37.8	36.0	38.5	34.2	W	3																6								
	7	29.430	41.0	29.444	44.0	42.8	28.6			32.2	31.0	37.4	35.6	N	3	N	3														7								
	8	29.436	40.0	29.406	41.0	47.1	30.1			32.0	31.0	48.0	42.2			W	1 1/2														8								
	9	29.260	47.0	29.306	47.8	47.2	30.4			40.0	37.2	36.4	33.7	W	1	W	1 1/2														9								
	10	29.352	42.5	29.378	42.0	49.0	31.1			38.1	35.2	39.2	37.9	W	1																10								
	11	29.670	46.0	29.684	41.0	45.0	36.0			41.5	38.6	39.1	37.5	W	1 1/2	W	1														11								
	12	29.744	43.0	29.936	46.1	45.0	34.3			39.2	38.1	40.2	38.7	W	1	W	1														12								
	13	30.100	46.0	30.178	44.0	45.0	35.6			38.0	36.8	44.2	37.0	N	3	N	1														13								
	14	30.180	45.0	30.146	45.0	46.0	37.5			41.0	39.0	40.2	37.8	N	1	N	3														14								
	15	29.998	45.0	29.814	45.0	42.0	34.8			37.0	35.5	40.0	39.2	W	3	SW	3														15								
	16	29.662	45.5	29.588	46.0	46.0	31.8			42.2	41.3	41.6	40.7	S	1	S	1														16								
	17	29.386	46.0	29.486	45.0	45.8	31.8			43.0	42.0	40.2	37.6	SW	3	W	3														17								
	18	29.706	44.5	29.422	44.0	45.4	32.5			39.4	37.8	41.5	37.5	SW	1	W	1														18								
	19	29.402	39.0	29.360	42.0	42.2	34.5			37.0	35.2	37.0	35.0	W	1	W	1 1/2														19								
	20	29.278	42.0	29.396	42.0	42.4	34.7			36.5	35.0	39.0	36.2	W	3	W	1														20								
	21	29.360	44.0	29.364	45.0	43.0	34.8			40.5	39.0	37.0	34.6	SW	1 1/2	W	2														21								
	22	29.256	45.0	29.258	41.0	40.8	33.8			40.5	38.2	36.1	34.2	W	1 1/2	W	3														22								
	23	29.404	42.0	29.408	46.0	44.6	32.5			34.0	33.0	39.0	36.2	W	3	W	3														23								
	24	29.012	46.0	29.022	45.0	44.2	36.8			43.4	41.2	39.0	36.8	W	1	W	1														24								
	25	28.578	49.4	28.890	45.2	50.1	37.9			48.6	47.1	46.5	44.0	SW	2	SW	2														25								
	26	28.740	46.0	28.850	46.0	47.3	38.0			39.8	37.6	40.0	40.2	SW	3	SW	1														26								
	27	29.426	43.0	29.706	45.0	47.2	39.4			40.6	38.4	45.2	44.6	SW	3	SW	2														27								
	28	29.762	53.0	29.866	52.6	53.4	44.2			52.8	53.6	56.0	53.8	W	2	W	2														28								
	29	29.904	53.0	29.862	50.0	53.6	49.0			52.0	48.0	50.2	49.0	W	3	W	1														29								
	30	30.010	50.0	30.086	49.0	52.1	41.2			43.3	41.0	44.0	42.6	W	3	W	1														30								
	31																															31							
Sums.																																							
Means.																																							
† Total Corrections for Instrumental Errors.		+0.006	-0.7	+0.006	-0.7	-0.4	-0.1			-0.2	-0.3	-0.2	-0.3																										
† Corrections for Diurnal Range.																																							
"Corrected Means."																																							
No. of Column.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30								

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

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

Mean at Station, corrected, and at 32°, = _____

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

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

Highest Reading, corrected for Index error, on the _____ th, = _____

Lowest Do. Do., on the _____ th, = _____

Difference, or Monthly Range, = _____

* Each instrument tested at the Office in Edinburgh bears the stamp "S.M.S." and a number to be entered in the Heading; or the Number and Initials of the Maker may be here given.

† Embracing corrections for both capillarity and Index Errors.

‡ The Diurnal Range for Scotland is as yet unknown.

§ Periodically, though not absolutely a minus correction.

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

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

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

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

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

Difference, or Monthly Range, = _____

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

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

Difference, or Mean Daily Range, = _____

** Calculated Mean Temperature of Month, = _____

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

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

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

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

Difference of above Means or Range ("exposed"), = _____

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry

Bulb, (Cols. 9 and 11), = _____

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

10 and 12), = _____

† Computed Temperature of Dew-Point, = _____

† Do. Elastic Force of Vapour, = _____

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

† Relative Humidity, (Saturation = 100), = _____

RAIN fell on _____ Days; Amount in Inches, = _____

WIND.		SUMMARY.										
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.	
A.M.												
P.M.												
Mean.												

Observations made and
Return verified by _____

(Signed) James Dale

INSTRUCTIONS

FOR TAKING METEOROLOGICAL OBSERVATIONS,

WITH REMARKS ON THE USE OF INSTRUMENTS.

One of the chief objects that the Scottish Meteorological Society proposed to itself when it was established in 1855, was to secure to itself the best means of observing the state of the atmosphere. Uniformity in the observations is absolutely necessary. It is, therefore, the duty of every observer to follow the instructions given in these pages, and to make his observations in the same manner as those of the other observers. It is also very desirable that observations on the same day should be made at the same time, and in the same place. It is, therefore, recommended that observations should be made at the same time every day, and in the same place. It is also recommended that observations should be made at the same time every day, and in the same place.

The Council of the Society recommend that the Self-Registering Thermometer, and the Dry and Wet Bulb Hygrometer, be kept in Stevenson's Louver-boarded Box, and that the observations be made in the same manner as those of the other observers. It is also recommended that observations should be made at the same time every day, and in the same place. It is also recommended that observations should be made at the same time every day, and in the same place.

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being of the scale of every instrument; the rejection of Thermometers, the frames of which are not likely to stand exposure to the weather, as shown in the past by repeated and annoying breakages of Thermometers, either Negretti and Zambis, or Phillips's, which they will act at the highest temperatures they may be required to register. By the laws of the Society, Members and Observers have a right to have their instruments compared by the Secretary, and to advise with him regarding the purchase of instruments.

Very great care should be bestowed on the Observations of the Wind, the accuracy of which, both as regards Direction and Force, is so essential towards the science of Meteorology. A Wind-Vane ought to be elevated at least 12 feet above surrounding objects. When it is placed in this position, it will give a true indication of the wind's direction, and when the wind is feeble, reference may be made to the direction of smoke, etc., in well-exposed situations. Careful observations are recommended to be made on the changes in the direction of the wind; and during storms, extra observations at every hour of Greenwich time. Such a system of simultaneous observation, pursued at different Stations, is likely to give highly valuable and important results, particularly in connection with the system of thickly-planted Stations over a limited district round Edinburgh called STORM STATIONS, in the course of being established by the Society for the systematic investigation of the relation of the force of the wind to Barometric Gradients, and other points connected with storms.

The Council would recommend the Hemispherical Cup Anemometer, a self-registering instrument which shows the amount of Wind that passes it per day; from which also the mean Velocity of the Wind at the time of observation may be ascertained. For indicating the Force of the Wind at any particular hour of observation, the Pressure Anemometer recently brought under the notice of the Society by Mr. T. Stevenson, the Honorary Secretary, and Mr. R. Ballingall, the Secretary at Edinburgh, are recommended as likely to secure uniformity in making observations on the Force of the Wind.

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

In such gauges as Fleming's, which are furnished with a metal float, and attached to a float, the float ought to be fixed in the ground, and the post itself should be of such a nature as to be fixed in the ground.

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

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

Observations of the Clouds are made at 9 a.m. and at sunset, as illustrating the condition and currents of the upper and lower regions of the atmosphere. The entries in the schedule are to be made in the following manner:—Thus, in the column Velocity and Direction, 6, S. W. will indicate that the upper strata of Clouds travel with extreme velocity from S.W. and those in the lower regions from W., with one-third the speed of the former. Again, in the second Cloud column, an entry of 4, st. will indicate that the higher regions are covered to the amount of 4-tenths with stratus Clouds; and that the sky is further obscured to the extent of 2-tenths by lower Clouds of the cumulo-stratus kind.

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

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

As the germination and growth of crops and plants generally, depend greatly on the temperature of the soil,—its amount and consistency,—the Council recommend that Observations in this interesting department be made at 9 a.m. by Thermometers permanently fixed in the soil, their bulbs being sunk to depths of 12, 18, and 22 inches, and fitted with sloping tin guards, to prevent rain water being conveyed to the bulbs by the stems or wooden of the plants.

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

OBSERVATIONS,

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

The Temperature of the water at the bottom of Wells ought, when practicable, to be taken, both the depth of the Well, and of the water being noted. Mention what Test-Papers are used, Schönbien's or Morin's, etc. The Paper is affixed by a pin to a board in the corner of the observer's Box, and the indications registered by a pen in the column of the Force and Direction of the wind at the time of observation, in the following manner:—thus 3rd W., as an example, in the schedule will indicate that the Ozone paper is tinted as 3 on the scale, that the wind is from the N.W., and that its force on the scale 0—5 is 4, or blowing fresh.

Too much importance cannot be attached to the electric condition of the atmosphere in connection with terrestrial magnetism, barometrical, thermometrical, and meteorological phenomena generally. A proper Electrometer is in truth, necessary to every complete meteorological observatory. The Remarks column is unavoidably too narrow. Some of the most valuable Observations that can be taken are those for which no rules can be given nor hours assigned. The use of contrivances, ought, therefore, to be taken every advantage of, and a list of such as are in general use are given at the foot of the column. Besides special and extraordinary Observations, great prominence ought to be given in this column to Prevailing 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, elevations, and fluctuations of the Barometer, Thunder-Storms, and remarkable falls of Snow, Hail, or Rain, the Hour of Storm of Wind commencing, attaining their maximum, and ending, as well as such notes on Storms as have been hinted at above. When lofty hills are in the vicinity of a Station, the Height of Clouds and of the Snow-line in winter should be recorded. By the use of abbreviations, the state of the weather at 9 a.m. and 9 p.m. should be registered either in two columns, otherwise unoccupied, or noted off for the purpose, from the column of 'Remarks.'

Observations in connection with the Periodic Return of the Seasons. Seasons, possess not only great scientific value, but are of considerable importance in connection with Agriculture, Horticulture, and Animal History. The Council would direct the special attention of Observers to the registration of such phenomena, and to the publication of the results of such observations, in the form of a Periodic Return of the Seasons, published annually, and confined to individual towns and shires; Observations ought to be confined to individual towns and shires; to particular species of birds, and in the case of crops, to specified seasons of year to year on a selected piece of ground, or farm, so that the results may be compared with those of other years, and indicate the species of plants and animals to which special attention is more particularly directed.

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

(By Order)

EDINBURGH.

Secretary of the Meteorological Society of Scotland,

BOOK POST.

Mr ALEXANDER BUCHAN.

Secretary of the Meteorological Society of Scotland,

EDINBURGH.

For London 1883

To



Have the goodness also to state any information you may be able to collect relative to the Crops of Grain, Hay, Potatoes, Turnips, Fruits, etc., whether plentiful, or in perfection: whether any have suffered from blight, disease, etc. Hay, Potatoes, Turnips, Fruits, etc., whether plentiful, or in perfection: whether any have suffered from blight, disease, etc.

SHRUBS, ETC.	FRUITS.	First in Blossom.	First in Fruit.	First in Harvest.	Departure.
Barberry.	Apple.	Black Currant.	Cherry.	Gean.	Hawthorn.
Broom.	Hazel.	Gooseberry.	Holly.	Laburnum.	Plum.
Mountain Ash or Rowan.	Mezereau.	Strawberry.	Swan.	Thorn.	Willow.
Red Flowering Currant.	Black Currant.	Cherry.	Gooseberry.	Holly.	Laburnum.
White.	Barberry.	Apple.	Black Currant.	Cherry.	Gean.

FOREST TREES.	In Flower.	In Leaf.	First in Leaf.	First in Fruit.	First in Harvest.	Departure.
Alder.	Barley.	Beet.	Brick.	Elm.	Larch.	Time.
Oak.	Sycamore or Plane.	Alfalfa.	Peas.	Potatoes.	Rye Grass.	Time.

OBSERVATIONS IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

EDINBURGH, December 1882.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Gordon's College, Abdee, County of Aberdeen, in Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 1 miles.Height of Cistern of the Barometer above Mean Sea-level 66 feet, above Ground 24 feet.During the MONTH of December 1883.

The Hours of Observation are of Greenwich Time.

Columns 20, 21, 22, 23 misplaced from 14th to 19th.

* The Bar. and A.T. only for 1 and 2 are misplaced.

ELECTRICITY.	Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER. No. —				WIND.				RAIN.		CLOUDS.				THERMOMETERS under Ground.			SEA.	OZONE.	GENERAL REMARKS. As to occurrence of Thunder, Lightning, Storms, Hail, Meteors, Remarkable Depression or Elevation of Barometer, Prevalent Diseases, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.		
		9 h. A.M.		9 h. P.M.		Protected in Shade, 4 feet above Ground.		Exposed Black Bulbs.		9 h. A.M.		9 h. P.M.		9 h. A.M.		9 h. P.M.		No. of hours in which it fell.	Amount in inches.	9 A.M.		P.M.		9 h. A.M.								
		Barometer. * No.	Attach- ed Ther- mometer	Barometer. No.	Attach- ed Ther- mometer	Max. No.	Min. No.	Max. in Sun's rays No.	Min. on Grass. No.	Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.	Force.	Direction.	Force.			Readings of the H. Cup Anemometer. No. —	Velocity (0—10), and Direction.	Amount (0—10), and Species.	Velocity (0—10), and Direction.	Amount (0—10), and Species.	No. 8 inches.	No. 12 inches.					No. 22 inches.	
		inches.	°	inches.	°	°	°	°	°	°	°	°	°	°							9 h. A.M.	*	*	Am.	Sp.						°	°
7	2	30.100	48.0	29.790	50.0	46.0	38.5			41.2	39.8	39.1	37.0	N.W.	1/2	—	—	—										Beautiful bands of cir. N.W. to S.E.	1			
8	1	30.272	47.0	30.186	49.0	46.6	36.0			39.4	37.3	43.5	39.7	W	1/2	W	1/2	.02	1	ci	—	—	2							2		
	3	29.480	48.0	29.330	46.8	44.8	32.4			42.2	41.0	35.0	32.3	N.W.	1	N.W.	2	.42	2	ci	—	—	4						Snow	3		
	4	29.640	44.0	30.054	44.2	44.0	32.6			40.0	37.8	39.0	37.0	N	1 1/2	N	1/2	.12	3	st	—	—	4							4		
	5	30.116	45.0	30.090	41.0	40.0	33.2			36.0	35.1	35.3	34.2	N	1	N	1	.05	4	cu-st	8	cu	5							5		
	6	30.336	46.5	30.324	41.0	39.0	33.0			38.0	34.1	36.0	33.2	N.E.	1	—	—	—	5	10	st	—	—	4							6	
	7	30.496	44.3	30.356	38.5	39.5	30.1			35.8	33.2	32.0	30.7	—	—	—	—	—	6	3	st	10	st	5							7	
	8	30.224	42.5	30.090	44.5	45.8	28.8			39.8	38.2	41.5	40.0	N.W.	1/2	N.W.	1/2	—	7.5	ci-st	—	—	0								8	
29	9	29.882	45.0	29.842	43.6	44.9	35.9			42.7	41.6	37.4	35.1	S.W.	1/2	—	—	—	8	cu-st	2	cu	1								9	
	10	29.592	46.0	29.184	47.3	42.9	33.7			39.0	37.4	37.4	32.2	S.W.	1/2	—	—	—	9	10	cu-st	1	st	1							10	
	11	29.268	46.0	28.780	41.0	42.0	32.6			38.6	35.2	40.0	39.0	—	—	N.W.	2 1/2	.40	10	cu-st	10	cu	4						Sleet	11		
	12	29.290	45.0	29.676	41.0	43.0	33.8			36.1	34.4	36.2	33.8	N	2	N	1	.09	—	—	10	cu-st	4						Lunar halo	12		
	13	29.204	48.0	29.270	47.0	54.8	34.6			42.8	41.0	46.1	41.3	S.W.	1	S.W.	1	—	10	cu-st	3	ci	4								13	
	14	29.184	44.0	29.128	42.5	48.8	35.9			39.0	37.8	38.3	34.5	W.	1/2	W.	1	.02	8	ci-st	2	cu	5								14	
	15	29.320	44.5	29.332	44.5	39.8	33.0			38.0	36.2	36.2	35.4	N.W.	1	N.W.	1	.08	2	st	7	cu-st	4								15	
	16	29.446	43.0	30.258	42.0	39.0	33.5			36.3	34.0	36.0	34.0	N.W.	2 1/2	N.W.	2	.22	6	ci	8	ci-st	—						Snow and sleet	16		
	17	30.444	42.0	30.376	41.0	37.8	33.0			37.0	34.0	37.2	35.2	N.	1	—	—	—	6	cu-st	2	cu-st	—								17	
	18	30.136	41.0	30.060	41.0	45.2	33.1			36.7	34.9	42.0	38.4	N	1/2	N.W.	1 1/2	.14	10	st	8	cu-st	3								18	
	19	30.054	46.0	29.732	45.0	44.0	38.9			42.2	39.3	42.0	40.8	N.W.	1 1/2	N.W.	2	.06	19	ci-st	10	st	2								19	
	20	29.680	47.0	29.634	44.8	49.0	39.0			45.8	43.8	40.5	38.2	N.W.	1/2	N.W.	1	.07	6	ci-st	2	st	2								20	
	21	29.376	46.5	29.364	45.5	46.8	35.7			38.0	36.2	39.0	37.2	S.W.	1 1/2	S.W.	1	.02	4	st	2	st	4								21	
	22	29.398	44.0	29.388	44.5	42.1	34.3			38.0	36.8	36.0	35.2	W.	1/2	W.	1	.36	10	st	10	st	—								22	
	23	29.980	44.2	30.098	42.0	38.0	33.1			37.1	33.4	33.0	31.0	S.W.	1 1/2	S.W.	1	.25	1	st	2	st	4								23	
	24	30.072	49.0	30.220	46.5	53.0	33.2			46.0	44.0	52.4	49.4	S.	1	S.	1	—	4	ci	2	ci-st	2								24	
	25	30.334	48.0	30.364	46.2	53.0	36.2			46.3	46.3	37.2	36.2	S.W.	1/2	—	—	—	2	st	—	—	4								25	
	26	30.480	46.4	30.408	45.0	40.7	32.2			35.3	34.1	37.0	36.0	S.W.	1/2	—	—	—	8	ci-st	—	—	4								26	
	27	30.398	44.2	30.194	45.0	43.0	29.5			40.1	39.2	42.4	42.0	S.W.	1	S.W.	1	.06	10	st	10	Nim	—								27	
	28	30.082	44.0	30.120	46.0	44.6	36.2			42.0	40.8	44.6	43.7	S.W.	1	S.	1	.01	6	st	10	st	—								28	
	29	30.094	47.0	30.084	46.0	47.5	43.1			47.0	45.2	45.1	43.8	S.W.	1	W.	1/2	.11	10	st	10	st	—								29	
	30	30.396	45.0	30.528	45.0	46.1	32.5			42.0	41.0	33.7	32.5	N.W.	1	—	—	—	10	st	—	—	2								30	
	31	30.586	38.4	30.572	42.5	45.9	29.5			34.4	32.8	30.5	29.5	S.W.	1	—	—	—	4	ci-st	—	—	4								31	
Sums.		11 18 11	163	11 18 11	136	17 11	41 1/2			177	15 11	156	147		8		3		6													
Means.		29.752	157.5	29.032	135.9	140.6	125.4			30.58	24.5	27.16	20.85		28.0		24.0		18.247				197		129	82						
† Total Corrections for Instrumental Errors.		29.927		29.904	44.4	44.5	34.0			39.9	38.0	38.8	36.7		0.90		0.77						6.4		4.2							
‡ Corrections for Diurnal Range.		+0.006	-0.7	+0.007	-0.7	-0.4	-0.1			-0.2	-0.1	-0.2	-0.1		0.6		0.6															
"Corrected Means."		29.933	44.4	29.911	43.7	44.1	33.9			39.7	37.8	38.6	36.5																			
No. of Column.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	

NOTATION USED IN GENERAL REMARKS.

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

TABLE FOR ESTIMATING FORCE OF WIND.

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

BAROMETER, "corrected Mean" at 9 A.M., minus the Correction†† = 29.890
for Temp. (Col. 2), = 29.933 -0.043.....
Corrected Mean" of Barometer at 9 P.M., minus the Correction†† = 29.870
for Temp. (Col. 4), = 29.911 -0.041.....
Mean at Station, corrected, and at 32°, = 29.880
Correction for height, feet above Mean Sea-level, = .074
Mean, reduced to 32°, and Sea-level, = 29.954
Highest Reading, corrected for Index error, on the th, = 30.586
Lowest Do. Do., on the th, = 28.780
Difference, or Monthly Range, = 1.806

S.-R. THERMOMETER, (in shade, etc.), Highest in Month, (corrected for Index Errors), on the th, = 54.4
Lowest in Month, corrected for Index errors, on the th, = 26.7
Difference, or Monthly Range, = 27.7
"Corrected Mean" of all the Highest, (Col. 5), = 44.1
"Corrected Mean" of all the Lowest, (Col. 6), = 33.9
Difference, or Mean Daily Range, = 10.2
* Calculated Mean Temperature of Month, = 39.0

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

HYGROMETER, Mean (corrected) A.M. and P.M. Reading of Dry Bulb, (Cols. 9 and 11), = 39.2

Mean (corrected) A.M. and P.M. Reading of Wet Bulb, (Cols. 10 and 12), = 37.2

†† Computed Temperature of Dew-Point, = 34.6

†† Do. Elastic Force of Vapour, = .201

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

†† Relative Humidity, (Saturation = 100), = 84

RAIN fell on 18 Days; Amount in Inches, = 2.47

WIND.		SUMMARY.									
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force.	Mean Velocity in miles per day.
A.M.	5	1	0	0	1	1	3	8	2	0.90	
P.M.	3	0	0	0	2	4	4	8	10	0.77	
Mean.	4	1	0	0	1	8	3	8	6	0.84 = 0.71	

