

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Duthie Park Aberdeen, County of Aberdeen, During the MONTH of January 1905.

Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 2 miles. Height of Cistern of the Barometer above Mean Sea-Level 44 feet, above Ground 4 feet.

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches on grass

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				RAIN.	WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.					GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. <i>Mention the hour at which Storms, including Thunder and Lightning, began and ended.</i>	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	9 A.M.		9 P.M.		Protected in Screen, 4 feet above Ground.		Black Bulb Max. in Sun.	Min. on Grass.	9 A.M.		9 P.M.			Amount at 9 A.M.	9 A.M.		9 P.M.		Ane- mometer. 9 A.M.	9 A.M.			9 P.M.		9 A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Barometer. No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	No.	No.			Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.		Force. Scale of 0-12.	Direction.	Force. Scale of 0-12.	Species and Direction.		Amount (0-10).	Species and Direction.	Amount (0-10).	No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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1	30.455	43	30.400	46	39.0	32.0			38.0	35.0	39.0	38.0	0.03	NW	2	NW	1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.970
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.946
 Mean at Station, corrected, and at 32° = 29.958
 Correction for height, feet above Mean Sea-level, = + 1.50
 Mean, reduced to 32°, and Sea-level, = 30.008
 Highest Reading, corrected for Index error, on the 26th, = 30.675
 Lowest Do. Do., on the 17th, = 29.015
 Difference, or Monthly Range, = 0.660

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 30th, = 55.0
 Lowest in Month, corrected for Index errors, on the 19th, = 25.0
 Difference, or Monthly Range, = 30.0
 Mean of all the Highest, = 44.1
 Mean of all the Lowest, = 34.7
 Difference, or Mean Daily Range, = 9.4
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 39.4
 S.-R. THERMOMETER, Min. on Grass, Lowest in Month, =
 " " Mean, =
 Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 38.8
 Wet Bulb, Mean of A.M. and P.M. Readings, = 36.5
 Computed Temperature of Dew-Point, = 33.5
 Do. Elastic Force of Vapour, = 1.92
 Do. Relative Humidity (Saturation = 100), = 82
 RAIN fell on 10 Days; Amount in Inches, = 0.61

WIND.	SUMMARY.									
	Direction.	N	NE	E	SE	S	SW	W	NW	Mean Force 0-12.
A.M.		-	-	-	4	3	11	9	4	3.24
P.M.		-	-	-	2	5	7	11	5	3.38
Sum.		0	0	0	6	8	18	20	9	3.3

Observations made and Return verified by

Peter Harper

(Signed)

N.B.—Rain to be measured at 9 A.M. and the amount entered to the previous day. See instructions on back of Schedule.

INSTRUCTIONS

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the **BOARD OF TRADE** pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the readings after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Directed of Leaves.	CHOIRS mentioning variety.	Sowing or Planting.	Arreparing above Ground.	In Bar or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

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

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the notebook or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (—) should be entered on the Schedule rather than the figure 0.

Snow or Hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered on the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

ADDITIONAL REMARKS.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W.	4
Cum. Str. S.W.	2

 would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A **MAXIMUM THERMOMETER**, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 A.M.

A **MINIMUM THERMOMETER** on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder or Lightning or both together; of all Auroras, Meteors, or Halos round the sun or moon; of Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

THE SECRETARY,

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Duthie Park Aberdeen, County of Aberdeen, During the MONTH of February 1905.
 Lat. 57.9 N, Long. 2.6 W, Distance from Sea 2 miles. Height of Cistern of the Barometer above Mean Sea-Level 44 feet, above Ground 4 feet.
 Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches.
 The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				RAIN.	WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.					GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.							
	9 A.M.		9 P.M.		Protected in Screen, 4 feet above Ground.		Black Bulb Max. in Sun. No.	Min. on Grass. No.	9 A.M.		9 P.M.			Amount at 9 A.M. inches.	9 A.M.		9 P.M.		Ane- nometer. 9 A.M.	9 A.M.			9 P.M.		9 A.M.											
	Barometer. No.	Attached Ther- mometer	Barometer. No.	Attached Ther- mometer	Max. No.	Min. No.			Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force. Scale of 0-12.	Direction.	Force. Scale of 0-12.		Species and Direction.	Amount (0-10).		Species and Direction.	Amount (0-10).	No. 3 ins.	No. 12 ins.	No. 22 ins.			No. 36 ins.	No. 48 ins.					
																																inches.	°	inches.	°	°
1	29.675	44.	29.315	44.	48.0	35.5	44.		40.6	37.0	35.8	33.0	0.09	N	2	N	4		Ci	2	Ci	2									Fair blue all day / Wild Stormy P.M.	1				
2	29.490	42.	29.775	42.	40.0	37.0			38.0	35.0	36.0	34.2	0.08	N	3	N	2		Ci	5	Ci	5									Clear slight sleet showers, snow falling	2				
3	30.105	40.	30.000	45.	38.2	26.6			27.2	26.0	33.0	32.0	0.10	N	1	SW	0.5		Ci	3	Ci	8									Some snow, turning to rain	3				
4	29.880	43.	30.000	46.	50.0	31.2			41.5	38.6	45.5	41.0	0.00	N	1	SW	1.5		Ci	6	0	0									most snow nearly gone, fine,	4				
5	30.020	44.	30.010	51.	57.0	42.2			44.8	42.8	49.0	47.0	0.00	SW	5	SW	2		Ci	5	0	0									fair & very fine all day	5				
6	29.825	49.	30.000	48.	49.6	43.8			42.0	44.8	34.6	33.4	0.00	SW	2	SW	1		Ci	8	0	0									fair breezy, some rain 10 to 12.5	6				
7	30.200	44.	30.350	43.	46.6	32.0			36.0	33.0	32.0	31.0	0.00	N	1	SW	5		0	0	0	0									fair slight frost, fine all day	7				
8	30.250	42.	30.200	50.	45.2	28.4			36.5	35.2	45.0	43.2	0.20	SW	1	SW	2		Ci	10	Ci	8										Some slight rain 9 to 11 then fair	8			
9	30.095	46.	29.950	47.	50.0	44.0			45.0	42.6	45.0	42.0	0.00	SW	3	SW	1		Ci	2	Ci	2										fair and fine all day	9			
10	30.100	45.	30.150	48.	42.2	37.0			38.0	34.6	35.0	32.6	0.04	N	1	NW	2		Ci	5	Ci	5										fair & fine cool showers, rain 6 P.M.	10			
11	30.210	41.	30.355	39.	34.0	28.8			30.4	28.4	32.0	28.5	0.02	NW	2	NW	3		Ci	3	Ci	5										Stormy, some snow frequent	11			
12	30.410	34.	30.350	44.	36.0	25.0			28.2	27.4	36.0	35.0	0.23	N	1	NW	5		Ci	5	Ci	10										fair frost, some snow, very mild	12			
13	30.210	40.	30.300	48.	48.5	31.0			36.2	35.4	46.4	43.0	0.00	SW	5	N	1		N	10	Ci	3										dull frost, very fine all day	13			
14	30.400	40.	30.400	50.	52.2	35.4			43.8	40.2	40.0	35.0	0.02	N	1.5	N	5		Ci	2	Ci	3										fine fair, all day.	14			
15	30.150	46.	30.150	45.	50.6	36.8			44.4	40.0	40.0	38.0	0.00	N	2	N	5		Ci	4	Ci	5										some slight rain, then fair	15			
16	29.950	46.	29.620	48.	52.4	36.8			41.2	40.1	46.8	44.5	0.00	SW	1	SW	2		Ci	2	Ci	1										fair & very fine all day	16			
17	29.650	45.	29.900	48.	47.0	34.4			39.0	35.0	34.5	32.8	0.01	N	2	N	0.5		0	0	2											Do Do Do	17			
18	29.350	45.	29.245	47.	55.0	32.0			41.8	41.2	38.2	38.0	0.00	SW	2	SW	4		Ci	4	Ci	0											Some showers from 10 A.M.	18		
19	29.350	45.	29.675	42.	41.2	35.4			37.8	34.2	31.2	30.0	0.16	NW	2	NW	3		Ci	1	Ci	4											fair, snow showers from 10 A.M.	19		
20	30.100	42.	30.450	42.	44.2	30.0			46.8	43.8	36.0	34.4	0.00	SW	3	N	2		Ci	6	Ci	8											snow showers turning to sleet	20		
21	30.625	42.	30.695	44.	41.0	34.5			37.0	33.5	35.0	33.8	0.00	NW	1	0			Ci	8	Ci	4											dull fine all day, clear frost P.M.	21		
22	30.660	41.	30.575	42.	44.0	29.0			31.6	29.8	29.5	28.0	0.00	SW	1	SW	0.5		Ci	5	0	0											slight frost fair & fine all day	22		
23	30.425	40.	30.310	41.	39.0	21.6			34.0	32.0	35.0	32.0	0.00	SE	0.5	SE	1		Ci	6	Ci	8											white frost fair & fine all day	23		
24	30.010	46.	29.850	45.	39.2	34.0			38.4	37.0	35.0	34.2	0.10	E	1	E	1		Ci	8	Ci	10											dull slight rain began early	24		
25	29.750	40.	29.520	45.	42.4	32.5			33.8	33.0	36.4	34.0	0.25	SE	0.5	S	1		Ci	8	Ci	6											fair dull mild, clear after rain	25		
26	28.900	43.	28.840	42.	41.6	33.0			39.0	38.0	35.2	35.0	0.12	S	4	S	2		Ci	10	Ci	2											heavy high wind with rain all night: fair	26		
27	28.750	42.	28.900	45.	40.0	36.0			40.0	38.7	37.0	36.0	0.48	SE	3	NW	1		0	10	Ci	10											high wind slight rain, heavy frequent rain	27		
28	28.900	41.	29.125	45.	44.8	30.0			33.0	32.5	39.0	37.0	0.16	N	1	NW	1		Ci	6	Ci	8											fair slight showers after 2 P.M.	28		
29																																				
30																																				
31																																				
Sums.	1293	8	1294	12	125	117			149	134	145	124	2.05							144	119													NOTATION USED IN GENERAL REMARKS.		
Means.	29.916	42.6	29.930	45.2	45.0	33.2			38.5	36.2	37.9	35.8																						a. denotes aurora.		
Correc-tions for Instru-mental Errors.	- 0.10		- 0.10																																d. drizzling rain.	
Correc-tions for Diurnal Range.																																				f. fog.
Cor-rected Means	29.906		29.920																																	fr. frost.
																																				h. hoar-frost.
																																				h. haze.
																																				hl. hail.
																																				l. lightning.
																																				lu. co. lunar corona.
																																				lu. ha. lunar halo.
																																				m. mist.
																																				p. passing showers.
																																				r. rain.
																																				r.2 heavy rain.
																																				sl. sleet.
																																				sn. snow.
																																				so. ha. solar halo.
																				</																

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.869
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.876
 Mean at Station, corrected, and at 32°, = 29.872
 Correction for height, feet above Mean Sea-level, = + 50
 Mean, reduced to 32°, and Sea-level, = 29.922
 Highest Reading, corrected for Index error, on the 11 th, = 30.695
 Lowest Do. Do., on the 27 th, = 28.750
 Difference, or Monthly Range, = 1.945

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 5 th, = 57.0
 Lowest in Month, corrected for Index errors, on the 23 th, = 21.6
 Difference, or Monthly Range, = 35.4
 Mean of all the Highest, = 45.0
 Mean of all the Lowest, = 33.2
 Difference, or Mean Daily Range, = 11.8
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 39.1
 S.-R. THERMOMETER, Min. on Grass, Lowest in Month, = 21.6
 " " Mean, = 33.2
 Black Bulb, Max. in Sun, Highest in Month, = 57.0

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 38.2
 Wet Bulb, Mean of A.M. and P.M. Readings, = 36.0
 Computed Temperature of Dew-Point, = 33.0
 Do. Elastic Force of Vapour, = .188
 Do. Relative Humidity (Saturation = 100), = 82
 RAIN fell on 15 Days; Amount in Inches, = 2.05

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INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER. — In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1/1000 inch, 0.100 inch, and 0.050 inch; that is to say, instead of 29.365 one of the following is sometimes set down—viz. 30.365, 29.265, or 29.315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Biggs,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

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

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the previous day on the Schedule: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided into hundredths of an inch—the highest line indicating .50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as .06, if up to the twenty-third line as .23, if up to the thirtieth line as .30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering .08 as simply 8, or .30 as .3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the notebook or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

47
49
38
1.37

The total, 1.37, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (—) should be entered on the Schedule rather than the figure 0.

Snow or Hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flenings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

ADDITIONAL REMARKS.

WIND, CLOUD, SUNSHINE, ETC.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example, Cir. W. 4 would indicate Cum. Str. S.W. 2 that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M. but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; of Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

THE SECRETARY,

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Duthie Park, County of Aberdeen, During the MONTH of March 1905.
 Lat. 57° 9' N, Long. 2° 26' W, Distance from Sea 2 miles. Height of Cistern of the Barometer above Mean Sea-Level 44 feet, above Ground 4 feet.
 Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches.

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				RAIN.	WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.					GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.	
	9 A.M.		9 P.M.		Protected in Screen, 4 feet above Ground.		Black Bulb Max. in Sun.	Min. on Grass.	9 A.M.		9 P.M.			Amount at 9 A.M.	9 A.M.		9 P.M.		Ane- moneter. 9 A.M.	9 A.M.			9 P.M.		9 A.M.					
	Barometer. No.	Attached Ther- mometer	Barometer. No.	Attached thermometer	Max. No.	Min. No.			Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.		Force. Scale of 0-12.	Direction.	Force. Scale of 0-12.	Species and Direction.		Amount (0-10).	Species and Direction.	Amount (0-10).	No. 9 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.			
	inches.	°	inches.	°	°	°	°	°	°	°	inches.																			
1	27.425	43	29.875	47	45.0	36.2			38.8	38.2	39.5	37.5	0.08	E	1	NW	1		ci	5	0					fair, Cold showers, fair 5 P.M.	1			
2	30.125	42	30.250	44	42.2	34.4			37.0	35.6	37.8	34.0	0.00	NW	1	NW	0.5		cu	8	ci	8					slight showers, then fair P.M.	2		
3	30.210	39	30.100	45	44.4	28.0			29.4	27.8	39.0	36.0	0.04	SW	1	SW	1.5		ci	2	0						clear white frost, fair all day	3		
4	30.000	44	29.950	47	51.0	34.0			39.5	38.0	36.0	35.0	0.05	W	1	SW	0.5		ci	8	0						fair & fine, rain forenoon, then fair	4		
5	29.700	46	29.875	47	45.5	34.0			42.2	41.0	40.0	37.8	0.13	S	1	W	1		ci	8	0						fair dull, rain from noon to dusk	5		
6	29.805	45	29.700	44	42.4	32.2			34.6	33.0	41.5	39.2	0.03	SW	1	SW	1		ci	6	0						fair white frost, some rain latter	6		
7	29.665	44	29.560	46	42.8	31.6			34.6	34.2	40.0	38.0	0.24	SW	0.5	W	2		ci	4	0						fair slight frost, rain from 10.15 to 3 P.M.	7		
8	29.750	44	29.425	47	46.0	31.0			41.5	36.4	41.2	40.0	0.00	W	3	SW	1		ci	2	0						fair breezy all day clear P.M.	8		
9	29.060	44	29.050	43	45.3	32.0			34.6	33.0	34.0	33.0	0.33	S	1	W	1		cu	6	0						fair dull, rain 10.30, heavy afternoon clear P.M.	9		
10	29.010	43	29.210	45	45.3	32.0			37.0	34.8	34.8	33.6	0.05	NW	2	NW	1		ci	8	ci	5						dull fair all day, some sunshine	10	
11	28.850	45	28.475	42	47.0	32.4			41.0	40.0	39.0	38.2	0.63	SE	1.5	SW	2		n	10	N	10						dull damp, rain from 10 A.M. heavy at times	11	
12	28.660	45	28.850	46	40.0	34.9			42.4	39.8	38.0	36.5	0.03	SW	1	SW	0.5		ci	4	ci	3						fair & fine slight showers afternoon	12	
13	28.980	44	29.150	47	50.7	34.6			40.0	37.6	41.5	40.0	0.16	SW	1	SW	1		ci	6	ci	6						fair & fine all day	13	
14	28.925	46	29.045	45	49.0	37.4			43.6	42.0	42.0	41.0	0.23	SW	1	S	1		n	10	ci	6						wet, clearing after 1 P.M. then fair	14	
15	28.625	46	28.650	47	47.2	38.9			44.1	43.5	42.5	40.0	0.00	SE	3	S	3		cu	8	ci	8						been wild showing night then fair	15	
16	28.940	46	29.215	47	48.5	39.4			43.0	40.6	42.0	40.4	0.02	S	2	S	1		ci	5	ci	5						fair dull most of the day	16	
17	29.305	46	29.500	49	47.4	41.0			43.2	42.5	42.0	41.0	0.04	SE	1	SW	0.5		ci	8	ci	3						dull damp fair all day	17	
18	29.550	46	29.650	49	49.0	30.0			41.8	41.2	40.5	39.0	0.09	S	1	SW	0.5		ci	8	0							white frost Am. some rain 10.12 Am.	18	
19	29.800	47	30.000	49	52.0	30.6			42.4	40.0	44.0	41.5	0.00	W	1	W	0.5		ci	2	ci	6						fair Am. mild all day	19	
20	29.975	48	29.860	49	46.8	32.5			42.6	40.8	41.0	40.0	0.00	SW	0.5	S	1		ci	5	ci	6						fair & fine all day	20	
21	29.820	47	29.920	49	47.0	34.4			42.6	41.4	37.5	36.8	0.00	S	1	SW	0.5		ci	8	hazy	10						dull some slight rain then fair	21	
22	29.900	47	29.800	50	49.5	33.6			43.0	42.0	43.0	41.4	0.00	S	1	S	1		ci	8	ci	8						dull damp fog clear P.M.	22	
23	29.720	48	29.760	49	46.0	42.0			44.4	43.5	42.5	41.0	0.15	S	2	S	1		ci	8	ci	4						dull fair all day	23	
24	29.875	47	29.975	49	42.8	40.4			42.2	41.8	40.5	40.0	0.14	SE	1	SE	1		n	10	n	10						rain from 7.30 Am. fair from 12 noon	24	
25	29.945	46	29.840	47	40.5	38.6			39.4	38.6	38.5	38.0	0.04	SE	1.5	SE	1.5		n	10	n	10						rain more or less all day	25	
26	29.760	46	29.660	47	44.6	36.0			38.4	38.0	40.5	39.0	0.02	SE	1	SE	1		n	10	n	10						rain from 9 Am. all day	26	
27	29.600	47	29.550	49	47.8	37.0			43.0	42.2	37.5	36.5	0.00	SW	0.5	SW	0.5		ci	8	0							dull some slight rain then fair	27	
28	29.550	47	29.450	48	51.6	33.0			43.1	41.2	40.0	38.5	0.00	SW	1	SW	1		8	8	0							dull fair all day	28	
29	29.490	47	29.560	49	52.5	36.7			44.4	41.8	38.8	36.5	0.00	SW	0.5	SW	0.5		ci	5	0							fair & fine all day	29	
30	29.600	47	29.650	50	55.0	34.2			46.6	42.0	41.0	37.0	0.00	SW	1	SW	1		ci	4	0							do do	30	
31	29.700	47	30.000	50	54.8	36.5			46.2	42.0	42.2	39.8	0.02	W	1	W	1		ci	5	ci	6						fair & fine showers noon	31	
Sums.	19105	1716	17123	19150	138				1310	114	114	107	5		3		5		16		7									
Means.	29.526	45.5	29.566	47.3	47.3	34.9			40.9	39.2	39.9	38.3	0.02		1.0		1.0		6.5		4.0									
Correc-tions for Instrumental Errors.	- 0.10		- 0.10																											
Correc-tions for Diurnal Range.																														
Cor-rected Means	516		336																											

NOTATION USED IN GENERAL REMARKS.											
a.	denotes aurora.										
d.	drizzling rain.										
f.	fog.										
fr.	frost.										
h-fr.	hoar-frost.										
h.	haze.										
hl.	hail.										
l.	lightning.										
lu. co.	lunar corona.										
lu. ha.	lunar halo.										
m.	mist.										
p.	passing showers.										
r.	rain.										
r.s.	heavy rain.										
sl.	sleet.										
sn.	snow.										
so. lu.	solar halo.										
q.	squall.										
q.s.	violent squalls.										
t.	thunder.										
t. s.	thunder-storm.										
		CLOUDS.									
		HIGH CLOUDS.									
		Cirrus.									cir.
		Cirro-stratus.									cir-str.
		Cirro-cumulus.									cir-cum.
		MIDDLE CLOUDS.									
		Strato-cirrus.									str-cir.
		Cumulo-cirrus.									cum-cir.
		LOWER CLOUDS.									
		Strato-cumulus.									str-cum.
		Cumulus.									cum.
		Cumulo-nimbus.									cum-nim.
		Nimbus.									nim.
		Stratus.									str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0-12).											
FORCE.				FORCE.				FORCE.			
0	Calm.	5	Fresh Breeze.	9	Strong Gale.	10	Whole Gale.	11	Storm.	12	Hurricane.
1	Light Air.	6	Strong Breeze.	7	Moderate Gale.	8	Fresh Gale.				
2	Light Breeze.										
3	Gentle Breeze.										
4	Moderate Breeze.										

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.471
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.507
 Mean at Station, corrected, and at 32° = 29.489
 Correction for height, feet above Mean Sea-level, = + 50
 Mean, reduced to 32°, and Sea-level, = 29.539
 Highest Reading, corrected for Index error, on the 10 th, = 30.250
 Lowest Do. Do., on the 15 th, = 28.625
 Difference, or Monthly Range, = 1.625

S-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 10 th, = 55.0
 Lowest in Month, corrected for Index errors, on the 3 th, = 28.0
 Difference, or Monthly Range, = 27.0
 Mean of all the Highest, = 47.3
 Mean of all the Lowest, = 34.9
 Difference, or Mean Daily Range, = 12.4
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 41.1
 S-R. THERMOMETER, Min. on Grass, Lowest in Month, =
 " " Mean, =
 Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 40.4
 Wet Bulb, Mean of A.M. and P.M. Readings, = 38.8
 Computed Temperature of Dew-Point, = 36.7
 Do. Elastic Force of Vapour, = 2.18
 Do. Relative Humidity (Saturation = 100), = 87
 RAIN fell on 20 Days; Amount in Inches, = 3.42

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0-12.
A.M.		-	-	1	6	7	11	4	2	-	2.4
P.M.			2		2	6	14	3		-	2.0
Sum.		0	2	1	8	13	25	8	5	0	2.2

Observations made and Return verified by Peter Harper

(Signed)

N.B.—Rain to be measured at 9 A.M. and the amount entered to the previous day. See instructions on back of Schedule.

INSTRUCTIONS

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

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FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier, at the top of the mercury column is set.

In the Board or Trade pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

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The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes the reading, after it is written down, should be compared again with the scale.

FOR TAKING

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvered Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others farther back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslin and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bare or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

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

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

METEOROLOGICAL OBSERVATIONS.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the previous day on the Schedule: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating '50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as '06, if up to the twenty-third line as '23, if up to the thirtieth line as '30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering '08 as simply 8, or '30 as '3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the notebook or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

.47
.42
.38
—
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (—) should be entered on the Schedule rather than the figure 0.

Snow or Hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flenings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

ADDITIONAL REMARKS.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted. Thus, for example, Cir. W. 4 2 would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

THE SECRETARY,

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.



Abenden
March 1903

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Duthie Park, Aberdeen, County of Aberdeen, During the MONTH of April 1905.
 Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 2 miles. Height of Cistern of the Barometer above Mean Sea-Level 44 feet, above Ground 4 feet.
 Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 in.
 The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				RAIN.		WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.					GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.
	9 A.M.		9 P.M.		Protected in Screen, 4 feet above Ground.		Black Bulb Max. in Sun. No.	Min. on Grass. No.	9 A.M.		9 P.M.		Amount at 9 A.M.	9 A.M.		9 P.M.		Anemo- meter. 9 A.M.	9 A.M.		9 P.M.			9 A.M.						
	Barometer. No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	Max. No.	Min. No.			Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		Direc- tion.	Force. Scale of 0-12.	Direc- tion.	Force. Scale of 0-12.		Species and Direc- tion.	Amount (0-10).	Species and Direc- tion.	Amount (0-10).		No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.		
1	30.862	48.	29.780	49.	46.4	31.0			42.2	38.4	43.0	42.0	0.25	S.W.	0.5	8	0.5	8	ci	8	ci	10					25	fair & fine from 11 A.M. white frost on grass	1	
2	29.800	46.	30.020	49.	40.2	36.2			43.6	39.8	41.0	38.0	0.00	N.W.	2	N.W.	1	ci	3	0	0							fair & fine drying breeze all day	2	
3	30.075	46.	29.950	48.	32.0	30.8			40.2	37.8	41.0	40.0	0.00	S.W.	1	S.W.	1	ci	4	ci	2							fair, white frost fine all day.	3	
4	29.555	48.	29.500	47.	59.0	34.6			48.6	46.6	42.0	41.0	0.11	S.W.	2	N.W.	2	ci	8	n	10							Dull, fair, showers after 12 noon	4	
5	29.500	48.	29.800	47.	47.0	38.6			43.0	38.4	40.0	37.0	0.12	N.W.	2	N.W.	2	ci	4	u	3							S fair, breeze snow showers from noon	5	
6	30.000	45.	30.000	46.	46.0	39.0			30.0	31.8	32.5	29.8	0.13	N.W.	1	N.	1	n	10	0	0							S snow, some showers	6	
7	29.825	43.	29.880	45.	39.0	39.0			33.0	30.2	30.0	28.4	0.04	N.	1	N.W.	5	ci	6	0	0							S fair, hard frost snow showers	7	
8	29.890	42.	29.800	45.	42.0	21.0			35.0	32.2	36.0	33.5	0.08	N.	2	S.E.	1	ci	5	n	10							S Do Do some rain	8	
9	29.600	42.	29.525	43.	45.4	30.8			37.1	34.4	32.2	31.8	0.00	S	0.5	N.W.	1	ci	4	ci	6							fair & fine all day	9	
10	29.420	43.	29.325	44.	44.0	26.0			38.5	34.6	39.0	38.5	0.38	S	1	S	2	ci	6	ci	8							sl fair, white frost set from 10 P.M.	10	
11	29.325	45.	29.575	47.	45.4	35.0			38.6	37.8	39.5	38.0	0.03	S	1	S.W.	5	n	10	ci	8							Dull all day fair	11	
12	29.750	44.	29.850	45.	67.5	30.6			34.0	32.8	41.0	40.0	0.18	S.W.	1	S	1	fog	10	ci	8							Do Do	12	
13	29.750	46.	29.790	47.	45.0	41.0			43.4	43.0	43.0	42.6	0.52	S.E.	1.5	S	2	n	10	ci	10							rain set to 5 A.M. take rain	13	
14	29.750	47.	29.705	48.	45.0	42.6			44.1	43.4	43.0	42.0	0.53	S.E.	2	S.E.	1.5	n	10	n	10							sun fair all night rain from 1 P.M.	14	
15	29.755	47.	29.850	47.	43.0	41.8			42.2	42.0	43.0	42.0	0.16	S.E.	1	S.E.		n	10	n	10							rain, fair, heavy fair 9 P.M.	15	
16	30.000	46.	30.256	48.	47.0	41.8			43.0	42.0	42.0	38.0	0.00	S.E.	1	N	1.5	n	10	n	10							Dull fair all day somewhat	16	
17	30.300	46.	30.255	46.	46.6	39.8			42.0	37.6	39.5	35.8	0.03	E	1	E	1.5	ci	8	ci	4							fair dull clearing	17	
18	30.355	42.	30.355	47.	44.2	34.5			42.8	39.6	41.5	40.0	0.02	E	2	N.E.	2	ci	4	ci	6							sl fair cool, bright sun set after 10 P.M.	18	
19	30.240	46.	30.280	48.	50.0	36.6			43.0	39.0	47.0	47.0	0.00	N.E.	2	N.E.	1	ci	5	ci	4							fair & cool bright all day	19	
20	30.150	46.	30.100	46.	50.0	37.8			43.0	40.5	40.5	38.6	0.06	N.W.	1	N.W.	2	ci	7	ci	6							slight rain very cold & strong	20	
21	30.065	47.	30.150	46.	44.8	38.8			41.2	38.4	39.5	36.0	0.00	N.W.	2	N	1	ci	4	ci	4							cold showers backward	21	
22	30.045	47.	30.010	53.	53.0	35.0			46.8	46.1	42.0	22.0	0.00	N.W.	1	N.W.	1	ci	5	ci	7							fair & fine cool	22	
23	29.800	47.	29.780	48.	47.0	36.5			45.1	40.0	36.7	31.5	0.09	N.W.	2	N.W.	1	ci	5	ci	6							sl Do do	23	
24	29.755	45.	29.800	48.	49.2	34.8			43.0	38.7	40.4	38.0	0.02	N.W.	2	N.W.	1	ci	4	ci	6							fair & cool set to 10 P.M.	24	
25	29.805	47.	29.900	49.	49.4	37.4			45.0	39.2	42.0	38.0	0.00	N.W.	2	N	0	ci	4	ci	8							fair, sunny all day to 12 noon	25	
26	29.915	47.	29.950	49.	56.0	37.8			45.2	39.8	42.5	40.5	0.00	S.W.	1	S	1	ci	8	ci	5							fair, fine all day.	26	
27	29.756	48.	29.500	50.	53.0	36.0			46.8	45.0	47.0	47.0	0.09	S.W.	0.5	S.W.	1	ci	8	ci	8							fair. Dull mild, rain from 2 P.M.	27	
28	29.390	50.	29.390	51.	48.4	44.0			47.8	46.0	41.0	35.0	0.10	N.E.	5	S.E.	1	ci	8	n	10							fair Dull mild	28	
29	29.320	50.	29.500	52.	52.0	42.0			45.2	43.7	46.8	45.0	0.01	N.W.	1	S.W.	0.5	ci	10	ci	8							Dull, mild, wet, fair P.M.	29	
30	29.420	51.	29.380	51.	49.0	43.4			46.8	45.0	45.0	44.0	0.42	N.E.	0.5	N.E.	1	ci	8	fog	10							fair dull mild fog from 1 P.M.	30	
31																														31
Sums.	1410.6	15	1611.3	17	154	141			138	1612	113	147	33.7		3	3		206	196			337								
Means.	29.822	46.2	29.835	47.7	47.4	36.2			42.0	39.4	40.9	38.8		1.0	1.2		6.9	6.5												
Corrections for Instrumental Errors.	-0.10		-0.10																											
Corrections for Diurnal Range.																														
Corrected Means																														

NOTATION USED IN GENERAL REMARKS.											
a.	denotes aurora.										
d.	drizzling rain.										
f.	fog.										
fr.	frost.										
h.-fr.	hoar-frost.										
h.	haze.										
hl.	hail.										
li.	lightning.										
lu. co.	lunar corona.										
lu. ha.	lunar halo.										
m.	mist.										
p.	passing showers.										
r.	rain.										
r.2	heavy rain.										
sl.	sleet.										
sn.	snow.										
so. ha.	solar halo.										
q.	squall.										
q.2	violent squalls.										
t.	thunder.										
t. s.	thunder-storm.										
CLOUDS.											
High Clouds.											
Cirrus,	.	.	.	.	.	.	.	.	.	.	cir.
Cirro-stratus,	.	.	.	.	.	.	.	.	.	.	cir.-str.
Cirro-cumulus,	.	.	.	.	.	.	.	.	.	.	cir.-cum.
MIDDLE CLOUDS.											
Strato-cirrus,	.	.	.	.	.	.	.	.	.	.	str.-cir.
Cumulo-cirrus,	.	.	.	.	.	.	.	.	.	.	cum.-cir.
LOWER CLOUDS.											
Strato-cumulus,	.	.	.	.	.	.	.	.	.	.	str.-cum.
Cumulus,	.	.	.	.	.	.	.	.	.	.	cum.
Cumulo-nimbus,	.	.	.	.	.	.	.	.	.	.	cum.-nim.
Nimbus,	.	.	.	.	.	.	.	.	.	.	nim.
Stratus,	.	.	.	.	.	.	.	.	.	.	str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0-12).											
FORCE.				FORCE.				FORCE.			
0	Calm.	5	Fresh Breeze.	9	Strong Gale.	10	Whole Gale.	11	Storm.	12	Hurricane.
1	Light Air.	6	Strong Breeze.	10	Whole Gale.	11	Storm.	12	Hurricane.		
2	Light Breeze.	7	Moderate Gale.								
3	Gentle Breeze.	8	Fresh Gale.								
4	Moderate Breeze.										

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.766
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.774
 Mean at Station, corrected, and at 32°, = 29.770
 Correction for height, feet above Mean Sea-level, = + 50
 Mean, reduced to 32°, and Sea-level, = 29.820
 Highest Reading, corrected for Index error, on the 18 th, = 30.355
 Lowest Do. Do., on the 29 th, = 29.320
 Difference, or Monthly Range, = 1.035

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 4 th, = 59.0
 Lowest in Month, corrected for Index errors, on the 8 th, = 21.0
 Difference, or Monthly Range, = 38.0
 Mean of all the Highest, = 47.4
 Mean of all the Lowest, = 36.2
 Difference, or Mean Daily Range, = 11.2
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 41.8
 S.-R. THERMOMETER, Min. on Grass, Lowest in Month, =
 " " Mean, =
 Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 41.5
 Wet Bulb, Mean of A.M. and P.M. Readings, = 39.1
 Computed Temperature of Dew-Point, = 36.1
 Do. Elastic Force of Vapour, = 2.13
 Do. Relative Humidity (Saturation = 100), = 82
 RAIN fell on 22 Days; Amount in Inches, = 3.37

WIND.		SUMMARY.						
Direction.		N	NE	E	SE	S	SW	W
A.M.		2	4	1	4	3	6	0
P.M.		2	3	1	4	5	4	1
Sum.		4	7	2	8	8	10	1

N.B.—Rain to be measured at 9 A.M. and the amount entered to the previous day.
 See instructions on back of Schedule.

Observations made and Return verified by Peter Harper
 (Signed) _____

INSTRUCTIONS

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FOREIGN BAROMETER. — In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1/1000 inch, 0.100 inch, and 0.050 inch; that is to say, instead of 29.365 one of the following is sometimes set down—viz. 30.365, 29.265, or 29.315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg, . .				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Eye Grass,				

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

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

FOR TAKING METEOROLOGICAL OBSERVATIONS.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating .90, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as .06, if up to the twenty-third line as .23, if up to the thirtieth line as .30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering .08 as simply 8, or .30 as .3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the notebook or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

.47
.49
.38
1.27

The total, 1.27, would be entered on the Schedule.

The glass* must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (—) should be entered on the Schedule rather than the figure 0.

Snow or hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

ADDITIONAL REMARKS.

WIND, CLOUD, SUNSHINE, ETC.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example, Cir. W. 4 would indicate that four-tenths of the sky was covered with cirrus moving from the West and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M. but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M. and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder or Lightning or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Duthie Park, Aberdeen, County of Aberdeen, During the MONTH of May 1905

Lat. 37.9 N, Long 2.6 W, Distance from Sea 2 miles. Height of Cistern of the Barometer above Mean Sea-Level 44 feet, above Ground 4 feet.

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches

The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER.	Corrected Mean at 9 A.M., <i>minus</i> Correction for } =	30.029
Temp. =	— .65 }	
	Corrected Mean at 9 P.M., <i>minus</i> Correction for } =	30.051
Temp. =	— .67 }	
Mean at Station, corrected, and at 32°,	=	30.040
Correction for height, feet above Mean Sea-level,	= +	.49
Mean, reduced to 32°, and Sea-level,	=	30.089
Highest Reading, corrected for Index error, on the 14 th,	=	30.500
Lowest Do. Do., on the 1 th,	=	29.151
Difference, or Monthly Range,	=	1.349

S-R. THERMOMETER,	(in shade)	Highest in Month,	corrected for Index	=	65.8
	Errors, on the	9 th	th,		
Lowest in Month,	corrected for Index errors, on the	5 th	th,	=	72.0
Difference, or Monthly Range,				=	33.8
Mean of all the Highest,				=	57.1
Mean of all the Lowest,				=	41.7
Difference, or Mean Daily Range,				=	15.4
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.),				=	49.4
<hr/>					
S-R. THERMOMETER, Min. on Grass,	Lowest in Month,			=	
"	"	Mean,		=	
Black Bulb, Max. in Sun,	Highest in Month,			=	

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 49.5
Wet Bulb, Mean of A.M. and P.M. Readings, = 46.4
 Computed **Temperature of Dew-Point**, = 43.1
 Do. **Elastic Force of Vapour**, = 275
 Do. **Relative Humidity** (Saturation = 100), = 79
RAIN fell on 19 **Days; Amount in Inches**, = 1.38

WIND.		SUMMARY.								Calm or Variable.	Mean Force 0-12.
Direction.	N	NE	E	SE	S	SW	W	NW			
A.M.	3	5	1	1	3	9	1	8	0	2.6	
P.M.	4	3	1	3	4	8	0	8	0	2.2	
Sum.	7	8	2	4	7	17	1	16	0	2.4	

Observations made and
Return verified by

(Signed)

N.B.—Rain to be measured at 9 A.M. and the amount entered to the previous day.
See instructions on back of Schedule.

INSTRUCTIONS

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercuial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FOURNY BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern, till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1/1000 inch, 0.100 inch, and 0.050 inch; that is to say, instead of 29.365 one of the following is sometimes set down—viz. 30.365, 29.265, or 29.315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf buds first appear.	In Leaf.	Directed of Leaves.	Grasses (nominating variety).	Swelling or Planting.	Approaching above ground.	In Ear or Flower.	First Cut or Reaped.
Alder,					Barley,				
Ash,					Bore or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	Fruit ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,		Cuckoo,		
Bouree or Elder,		Black Currant,		Culver,		
Broom,		Cherry,		House-Swallow,		
Hazel,		Gean,		Lapwing,		
Hawthorn,		Gooseberry,		Plover,		
Holly,		Peach,		Sand-Martin,		
Laburnum,		Pear,		Starling,		
Lilac,		Plum,		Swan,		
Mezeron,		Strawberry,		Rail or Corn Crane,		
Mountain Ash or Rowan,						
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THE SECRETARY,

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Duthie Park, Aberdeen, County of Aberdeen, During the MONTH of June 1905.

Lat. 57.9 N, Long. 2.6 W, Distance from Sea 2 miles. Height of Cistern of the Barometer above Mean Sea-Level 44 feet, above Ground 4 feet.

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 4 inches.

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER.				RAIN.	WIND.				CLOUDS.				SUNSHINE.	THERMOMETERS under Ground.					GENERAL REMARKS.	Days of Month.		
	9 A.M.		9 P.M.		Protected in Screen, 4 feet above Ground.		Black Bulb, Max. in Sun.	Min. on Grass.	9 A.M.		9 P.M.			Amount at 9 A.M.	9 A.M.		9 P.M.		Ane-mometer. 9 A.M.	9 A.M.			9 P.M.		9 A.M.						
	Barometer. No.	Attached Ther-mometer	Barometer. No.	Attached Ther-mometer	Max. No.	Min. No.			Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force. Scale of 0-12.	Direction.	Force. Scale of 0-12.		Species and Direc-tion.	Amount (0-10).		Species and Direc-tion.	Amount (0-10).	No. 3 ins.	No. 12 ins.	No. 22 ins.			No. 36 ins.	No. 48 ins.
1	29.860	58.	29.850	58.	64.0	44.0			58.4	54.0	53.0	52.0	0.06	S	15	SW	1	ci	8	ci	8						fair and very fine all day	1			
2	29.660	56.	29.690	59	65.2	50.0			58.8	53.4	53.0	52.0	0.00	SW	2	SW	1.5	ci	5	ci	2						fair dull, clearing	2			
3	29.800	58.	29.800	57.	66.0	49.8			57.4	48.5	49.0	46.5	0.00	SW	2	SW	0.5	ci	5	ci	2						fair fine all day	3			
4	29.845	60.	29.950	58.	67.0	47.0			58.0	50.5	49.4	48.0	0.23	SW	1.5	W	1	ci	23	ci	6						fair showers after 4 P.M.	4			
5	30.060	56.	30.110	55.	67.0	44.0			54.0	49.5	47.2	45.0	0.01	SW	1	SE	0.5	ci	8	ci	0						fair fine, some light rain	5			
6	30.125	51.	30.125	53.	57.0	43.0			52.6	47.0	46.0	44.8	0.00	SE	2	W	1.5	ci	4	ci	4						rain, cold drying wind	6			
7	30.125	54.	30.240	53.	55.3	45.0			49.2	44.0	48.4	44.2	0.00	SE	2	SE	2	ci	8	ci	8						fair cold dull all day	7			
8	30.300	53.	30.325	54.	54.4	46.0			49.0	44.8	44.0	45.0	0.00	SE	1	SE	1	ci	8	ci	8						do do do	8			
9	30.260	53.	30.200	52.	56.2	43.0			51.0	47.2	46.8	44.8	0.00	SE	1	SE	0.5	ci	8	ci	2						do do do	9			
10	30.150	53.	30.160	53.	57.4	44.0			44.5	43.0	45.0	44.0	0.00	SE	1	E	0.5	ci	6	ci	2						fair cool more mild	10			
11	30.150	52.	30.140	56.	60.4	37.0			54.2	51.6	50.0	47.5	0.00	E	1	E	1	ci	4	ci	0						fair fine all day	11			
12	30.115	54.	30.145	53.	62.2	43.0			58.0	54.0	50.6	49.5	0.00	E	1	E	1	ci	2	ci	8						do do	12			
13	30.150	57.	30.125	55.	58.0	48.0			52.0	48.4	45.0	43.2	0.00	E	1	E	5	ci	8	ci	2						fair dull most of the day	13			
14	30.100	54.	30.050	56.	63.8	44.0			53.4	43.2	50.4	48.0	0.00	E	1	SE	5	fog	10	ci	4						do do	14			
15	29.940	56.	29.975	57.	63.0	45.4			55.0	52.8	52.0	48.5	0.00	E	1	SE	5	ci	6	ci	3						fair fine all day	15			
16	29.980	58.	29.960	57.	67.0	49.0			60.8	54.5	50.6	49.0	0.00	E	1	E	1	ci	2	fog	10						do do	16			
17	29.945	59.	29.900	60.	63.0	50.5			58.0	56.0	56.2	55.0	0.00	SE	1.5	SE	1.5	fog	10	fog	10						fog clearing, fog again P.M.	17			
18	29.850	59.	29.800	58.	65.0	54.5			60.0	56.8	53.0	52.2	0.10	SE	1.5	SE	0.5	ci	5	fog	10						fair fine, fog some rain	18			
19	29.710	58.	29.815	57.	68.2	53.0			57.0	55.5	53.8	51.6	0.00	SE	2	SE	0.5	ci	8	ci	0						some rain, fog, fair breeze	19			
20	29.775	60.	29.840	60.	63.0	53.8			58.0	53.0	54.0	52.0	0.21	SE	3	SW	2	ci	6	ci	0						fair, dry in wind, showers	20			
21	29.800	59.	30.075	60.	68.6	50.4			60.0	50.5	58.6	57.2	0.00	SW	2	W	2	ci	5	ci	5						do do	21			
22	30.350	59.	30.445	59.	67.0	54.8			59.8	55.5	55.0	52.0	0.00	SE	1	SE	0.5	ci	6	ci	6						fair & very fine all day	22			
23	30.300	64.	30.450	60.	69.5	53.5			65.0	58.0	56.3	53.8	0.00	SE	1	SW	1	ci	6	ci	0						do do	23			
24	30.400	63.	30.523	62.	63.5	51.4			60.0	52.0	55.0	52.0	0.00	SE	1.5	SE	1.5	ci	5	ci	0						do do do	24			
25	30.258	62.	30.204	61.	58.5	53.0			58.9	52.7	51.0	50.6	0.00	E	1	SE	1	fog	10	fog	10						fair, fog	25			
26	30.166	56.	30.000	58.	65.0	45.6			58.0	55.0	50.2	48.6	0.00	E	1	E	5	ci	4	ci	6						fair fog clearing, rain P.M.	26			
27	29.700	59.	29.820	62.	72.0	48.0			61.4	57.5	57.5	55.5	0.21	E	1	E	0.5	ci	4	ci	5						fog, clearing moon, again fog P.M.	27			
28	29.750	59.	29.750	61.	61.0	53.2			58.2	56.4	55.5	54.3	0.05	SW	1	SW	1	ci	8	ci	10						fine good rain, fair breeze, light rain P.M.	28			
29	29.775	59.	29.905	60.	65.6	54.7			57.8	58.0	57.8	55.8	0.00	SW	0.5	SE	0.5	ci	8	ci	6						dull fair & fine all day	29			
30	30.040	59.	30.125	61.	66.0	54.0			59.0	56.0	52.4	51.1	0.00	SE	1	E	0.5	ci	5	ci	2						fair fine all day	30			
31																													31		
Sums.	10114	16	10105	12	155	136			167	1310	147	139	0.87		3	7			10		9										
Means.	30.029	57.3	30.045	57.5	63.7	48.5			57.0	52.8	51.8	49.6			13	13			6.4		4.7										
Corrections for Instrumental Errors.	-0.10		-0.10		-3																										
Corrections for Diurnal Range.																															
Corrected Means	0.019		0.035																												

NOTATION USED IN GENERAL REMARKS.											
a.	denotes aurora.										
f.	"drizzling rain.										
fr.	"frost.										
h-fr.	"hoar-frost.										
h.	"haze.										
li.	"hail.										
l.	"lightning.										
lu. co.	"lunar corona.										
lu. ha.	"lunar halo.										
m.	"mist.										
p.	"passing showers.										
r.	"rain.										
r.2	"heavy rain.										
sl.	"sleet.										
sn.	"snow.										
so. ha.	"solar halo.										
q.	"squall.										
q.2	"violent squalls.										
t.	"thunder.										
t. s.	"thunder-storm.										
		CLOUDS.									
		HIGH CLOUDS.									
	Cirrus.										cir.
	Cirro-stratus.										cir.-str.
	Cirro-cumulus.										cir.-cum.
		MIDDLE CLOUDS.									
	Strato-cirrus.										str.-cir.
	Cumulo-cirrus.										cum.-cir.
		LOWER CLOUDS.									
	Strato-cumulus.										str.-cum.
	Cumulus.										cum.
	Cumulo-nimbus.										cum.-nim.
	Nimbus.										nim.
	Stratus.										str.

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0-12).											
FORCE.				FORCE.				FORCE.			
0	Calm.	5	Fresh Breeze.	9	Strong Gale.	10	Whole Gale.	11	Storm.	12	Hurricane.
1	Light Air.	6	Strong Breeze.	7	Moderate Gale.	8	Fresh Gale.				
2	Light Breeze.										
3	Gentle Breeze.										
4	Moderate Breeze.										

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.932
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.958
 Mean at Station, corrected, and at 32°, = 29.945
 Correction for height, feet above Mean Sea-level, = + 48
 Mean, reduced to 32°, and Sea-level, = 29.993
 Highest Reading, corrected for Index error, on the 23 th, = 30.500
 Lowest Do. Do., on the 2 th, = 660
 Difference, or Monthly Range, = 0.840

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 27 th, = 72.0
 Lowest in Month, corrected for Index errors, on the 11 th, = 37.0
 Difference, or Monthly Range, = 35.0
 Mean of all the Highest, = 63.4
 Mean of all the Lowest, = 48.5
 Difference, or Mean Daily Range, = 15.9
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 55.9
 S.-R. THERMOMETER, Min. on Grass, Lowest in Month, =
 " " Mean, =
 Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 54.4
 Wet Bulb, Mean of A.M. and P.M. Readings, = 51.2
 Computed Temperature of Dew-Point, = 48.1
 Do. Elastic Force of Vapour, = .335
 Do. Relative Humidity (Saturation = 100), = 79
 RAIN fell on 7 Days; Amount in Inches, = 0.87

WIND.		SUMMARY.						
Direction.		N	NE	E	SE	S	SW	W
A.M.		-	7	9	1	6	5	-
P.M.		1	6	8	3	4	5	2
Sum.		1	13	17	4	10	10	2

N.B.—Rain to be measured at 9 A.M. and the amount entered to the previous day.
 See instructions on back of Schedule.

Observations made and
 Return verified by

(Signed)

INSTRUCTIONS

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1/1000 inch, 0.100 inch, and 0.050 inch; that is to say, instead of 29.365 one of the following is sometimes set down—viz. 30.365, 29.265, or 29.315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES	In Flower.	Leaf Beds first Appear.	In Leaf.	Directed of Leaves.	CROPS mentioning variety.	Seeds or Planting.	Arising above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Peas,				
Larch,					Pease,				
Line,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

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

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

FOR TAKING METEOROLOGICAL OBSERVATIONS.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the previous day on the Schedule: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating .50, that is fifty hundredths or half an inch. The amounts should be entered on the Schedule thus: if up to say the sixth line in the glass as .06, if up to the twenty-third line as .23, if up to the thirtieth line as .30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering .08 as simply 8, or .30 as .3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the notebook or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

47
42
38
1 27

The total, 1.27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (—) should be entered on the Schedule rather than the figure 0.

Snow or Hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example, Cir. W. 4 would indicate that four-tenths of the sky was covered with cirrus moving from the West and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

ADDITIONAL REMARKS.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Duthie Park, Aberdeen, County of Aberdeen, During the MONTH of July 1905.

Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 2 miles. Height of Cistern of the Barometer above Mean Sea-Level 44 feet, above Ground 4 feet.

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches.

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.		RAIN.	WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.					GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	9 A.M.		9 P.M.		Max. No.	Min. No.	Black Bulb. Max. in Sun. No.	Min. on Grass. No.	9 A.M.			9 P.M.		9 A.M.		9 P.M.		Ane- mometer. 9 A.M.	9 A.M.		9 P.M.		9 A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Barometer. No.	Attached Thermometer	Barometer. No.	Attached Thermometer					Dry bulb.	Wet bulb.		Dry bulb.	Wet bulb.	Amount at 9 A.M.	Direction.	Force. Scale of 0-12.	Direction.		Force. Scale of 0-12.		Species and Direction.	Amount (0-10).	Species and Direction.	Amount (0-10).	No. 3 ins.			No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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1	30.100	58.30.025	59.64.5	46.8					59.8	55.0	56.0	49.8	0.06	AG	1	8	0.5		Ci	4	Ci	10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								</

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.877
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.886
 Mean at Station, corrected, and at 32° = 29.872
 Correction for height, feet above Mean Sea-level, = + 48
 Mean, reduced to 32°, and Sea-level, = 29.920
 Highest Reading, corrected for Index error, on the 9 th, = 30.255
 Lowest Do. Do., on the 29 th, = 29.590
 Difference, or Monthly Range, = 0.665

S-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 21 th, = 78.1
 Lowest in Month, corrected for Index errors, on the 23 th, = 41.8
 Difference, or Monthly Range, = 36.3
 Mean of all the Highest, = 67.6
 Mean of all the Lowest, = 49.6
 Difference, or Mean Daily Range, = 18.0
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 58.6
 S-R. THERMOMETER, Min. on Grass, Lowest in Month, =
 " " Mean, =
 Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 58.6
 Wet Bulb, Mean of A.M. and P.M. Readings, = 55.1
 Computed Temperature of Dew-Point, = 51.9
 Do. Elastic Force of Vapour, = 386
 Do. Relative Humidity (Saturation = 100), = 79
 RAIN fell on 13 Days; Amount in Inches, = 1.78

WIND.		SUMMARY.							
Direction.	N	NE	E	SE	S	SW	W	NW	Mean Force 0-12.
A.M.	3	2	6	6	7	4	3	-	1.1
P.M.	2	2	4	7	7	4	3	2	0.9
Sum.	2	5	6	13	13	11	7	5	1.0

Observations made and Return verified by Peter Harper

(Signed)

N.B.—Rain to be measured at 9 A.M. and the amount entered to the previous day. See instructions on back of Schedule.

INSTRUCTIONS

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BAROMETER.

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FORNIX BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fornix pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to below the front of the mercury touches the glass, which is where the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf buds first appear.	In Leaf.	Directed of Leaves.	GOOSE, mentioning variety.	Spading or Planting.	Any sowing above ground.	In Ear or Flower.	First Cut.
Alder,					Barley,				
Ash,					Bare or Biggs,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUIT.	First in Blossom generally.	FRUIT Ripe, mentioning variety.	Sowing or Planting.	Any sowing above ground.	In Ear or Flower.	First Cut.
Barberry,		Apple,						
Bourtree or Elder,		Black Currant,						
Broom,		Cherry,						
Hazel,		Gean,						
Hawthorn,		Gooseberry,						
Holly,		Peach,						
Laburnum,		Pear,						
Lilac,		Plum,						
Mezerion,		Strawberry,						
Mountain Ash or Rowan,								
Red Flowering Currant,								
Rhododendron Ponticum,								
Whin,								

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

FOR TAKING METEOROLOGICAL

OBSERVATIONS.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered at the previous day on the Schedule: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the notebook or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (—) should be entered on the Schedule rather than the figure 0.

Snow or Hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flenings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir.	W.	4	2
Cum.	Str.	S.W.	

 would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder or Lightning or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

ADDITIONAL REMARKS.

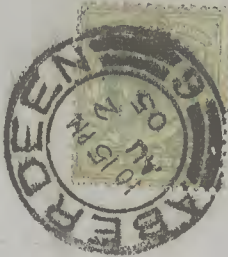
THE SECRETARY,

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at *Duthie Park, Aberdeen*, County of *Aberdeen*, During the MONTH of *August* 1905.Lat. _____, Long. _____, Distance from Sea *2* miles. Height of Cistern of the Barometer above Mean Sea-Level *44* feet, above Ground *4* feet.Diameter of Rain Gauge *5* inches. Height of Rim of Gauge above Ground *12 inches*

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.		RAIN.	WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.					GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.		
	9 A.M.		9 P.M.		Max.	Min.	Black Bulb Max. in Sun.	Min. on Grass.	9 A.M.			9 P.M.		9 A.M.		9 P.M.		9 A.M.			9 P.M.		No. 3 ins.	No. 12 ins.	No. 22 ins.			No. 36 ins.	No. 48 ins.
	Barometer. No.	Attached Thermometer	Barometer. No.	Attached Thermometer					Dry bulb.	Wet bulb.		Dry bulb.	Wet bulb.	Amount at 9 A.M.	Direction.	Force. Scale of 0-12.	Direction.	Force. Scale of 0-12.	Amount 9 A.M.		Species and Direction.	Amount 0-10.							
	inches.	°	inches.	°	°	°	°	°	°	°	inches.																		
1	29.870	57.	29.780	58.	66.4	46.0				53.8	51.6	56.5	53.0	0.04	SW	1	NW	1		Ci	3	Cum	6	6		fair fine, some showers <u>thunder</u> later	1		
2	29.815	57.	29.805	57.	66.4	47.4				57.4	52.0	54.8	52.2	0.00	NW	1	SE	1		Ci	4	Cu	8	8		fair fine, dull after 4 P.M.	2		
3	29.750	58.	29.550	59.	66.0	48.8				58.2	55.2	57.0	56.5	0.80	E	1.5	E	2		Ci	8	Ci	10	10		rain dull, heavy after 12 P.M.	3		
4	29.625	60.	29.400	59.	66.0	40.8				58.5	53.6	58.0	57.0	0.08	SE	1	SE	1		Ci	8	Ci	8	8		fair dull, clearing, dull P.M.	4		
5	29.315	60.	29.675	61.	62.0	55.0				60.8	58.6	56.0	52.0	0.05	S	1	N	1		Cu	10	Ci	8			fair dull all day, some rain	5		
6	29.850	59.	29.950	60.	67.2	40.0				58.8	52.6	56.6	51.5	0.01	SW	1.5	SW	0.5		Ci	5	Ci	6			fair & very fine all day	6		
7	29.860	58.	29.845	59.	66.8	51.4				57.4	54.8	56.0	54.0	0.02	SW	1	S	0.5		Ci	8	Ci	8			fair fine forenoon, dull P.M.	7		
8	29.940	59.	29.950	60.	67.2	51.0				58.0	54.9	54.4	52.4	0.09	SW	0.5	S	5		Ci	5	Ci	8			fair and very fine, showers later	8		
9	29.975	60.	29.900	60.	64.0	44.2				58.0	53.6	56.2	62.8	0.16	SW	0.5	SE	0.5		Ci	8	Ci	8			fair fine, dull after noon	9		
10	29.800	59.	29.805	59.	64.0	53.1				53.4	54.7	54.5	52.2	0.12	SE	1	NW	2		Ci	10	Ci	10			dull fair, heavy rain, rain later	10		
11	29.800	53	30.050	57.	60.6	45.0				53.2	48.6	52.5	49.0	0.06	NW	2	NW	1		Ci	6	Ci	6			heavy rain fine 2 P.M. slight later	11		
12	30.050	57.	30.075	59.	62.0	49.8				56.0	52.2	60.0	48.5	0.05	W	5	SW	1		Cu	6	Ci	8			been slight rain 9 P.M., rain heavy P.M.	12		
13	30.100	58.	30.150	58.	67.0	47.0				60.0	57.5	61.0	60.0	0.35	SW	1	SW	1		Ci	8	Ci	10			very fine, rain after 2 P.M.	13		
14	30.200	57.	30.200	50.	67.2	52.8				61.0	57.5	57.0	53.6	0.03	SW	5	SW	5		Ci	8	Ci	8			some slight rain fine afternoon	14		
15	30.200	59.	30.240	59.	64.2	44.2				56.0	54.0	54.0	52.4	0.00	SE	4	SW	4		Ci	6	Cu	8			fair fine all day	15		
16	30.225	59.	30.225	57.	64.4	42.6				55.0	53.0	51.0	44.0	0.00	SE	4	SW	4			0	0	0			fair & very fine all day	16		
17	30.100	60.	29.950	59.	63.0	50.0				57.0	56.0	55.0	54.0	0.36	S	4	S	5		haze	10	Ci	10			fair dull, damp from 2 P.M.	17		
18	29.625	58.	29.350	59.	67.2	54.0				56.5	55.0	56.0	53.0	0.06	SW	6	SW	4		Ci	8	Ci	4			fair dull fine to 5 P.M. then rain	18		
19	29.250	59.	29.730	58.	66.0	46.8				58.2	52.4	55.2	51.0	0.03	W	6	W	4		Ci	5	Ci	6			fair fine all day	19		
20	29.795	59.	29.985	59.	66.0	46.0				57.0	51.6	52.5	60.0	0.00	W	4	S	0.2		A	3	-	0			fair & very fine	20		
21	29.940	58.	29.725	59.	60.2	44.4				53.2	51.6	57.0	54.7	0.00	S	1	S	8		Ci	5	Ci	4			21-22, Thunder Short Sharp no rain	21		
22	29.700	57.	29.800	58.	67.4	46.0				56.5	54.0	54.0	51.6	0.00	SW	4	SW	4		Ci	2	0	0			fair fine breeze afternoon	22		
23	29.750	55.	29.790	58.	63.0	44.0				53.2	51.2	56.0	54.0	0.05	NW	2	NW	5		Ci	3	Ci	8				23	23	
24	29.800	58.	29.900	58.	67.4	51.0				53.0	51.8	53.0	49.8	0.00	NW	8	NW	4		Ci	6	Ci	8			been showers cool settled	24		
25	29.900	57.	29.920	58.	67.4	53.1				56.0	53.0	52.0	50.0	0.10	S	2	S	1		Ci	8	Ci	8			fair dull fine all day	25		
26	29.900	57.	29.875	58.	66.4	51.4				54.4	53.6	55.0	53.5	0.41	SE	1	SE	4		Ci	10	Ci	10			dull, rain frequent all day	26		
27	29.780	58.	29.740	58.	67.0	62.2				53.2	54.8	55.0	54.4	0.05	SE	4	SE	4		Ci	10	Ci	10			dull, continuing minor but all day	27		
28	29.500	57.	29.500	58.	67.2	52.0				56.0	54.8	56.0	53.0	0.20	NW	1	NW	2		A	10	N	10			dull some wet	28		
29	29.600	56.	29.740	57.	69.1	52.0				52.5	52.0	53.0	52.0	0.07	NW	3	NW	2		A	10	Ci	8			very wet up to 1 P.M. then fair	29		
30	29.875	57.	30.050	58.	68.0	52.0				53.0	52.0	54.0	52.5	0.00	N	5	NW	2		Ci	10	Ci	8			dull fair all day	30		
31	30.200	57	30.150	58.	62.2	45.7				56.0	51.4	56.0	53.0	0.00	NW	1	NW	1		Ci	8	Ci	8			fair mild all day	31		
Sums.	1894	18	1812	21	175	127				177	132	144	127	9	2	817					191	212							
Means.	29.836	57.4	29.865	58.2	63.4	48.7				56.7	53.9	53.4	52.9	26	26					62	7.2								
Corrections for Instrumental Errors.	-0.10		-0.10																										
Corrections for Diurnal Range.	-0.15																												
Corrected Means																													

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = *29.749*
Corrected Mean at 9 P.M., minus Correction for Temp. = *29.777*
Mean at Station, corrected, and at 32°, = *29.763758*
Correction for height, feet above Mean Sea-level, = + *4.5*
Mean, reduced to 32°, and Sea-level, = *29.806*
Highest Reading, corrected for Index error, on the 15th, = *30.240*
Lowest Do. Do. on the 19th, = *29.250*
Difference, or Monthly Range, = *0.990*

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 22th, = *67.4*
Lowest in Month, corrected for Index errors, on the 6th, = *40.0*
Difference, or Monthly Range, = *27.4*
Mean of all the Highest, = *63.4*
Mean of all the Lowest, = *48.7*
Difference, or Mean Daily Range, = *14.7*
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = *56.0*
S.-R. THERMOMETER, Min. on Grass, Lowest in Month, = _____
" " Mean, = _____
Black Bulb, Max. in Sun, Highest in Month, = _____

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = *56.0*
Wet Bulb, Mean of A.M. and P.M. Readings, = *53.4*
Computed Temperature of Dew-Point, = *51.0*
Do. Elastic Force of Vapour, = *37.5*
Do. Relative Humidity (Saturation = 100), = *83*
RAIN fell on *22* Days; Amount in Inches, = *3.24*

WIND.	SUMMARY.									
	Direction.	N	NE	E	SE	S	SW	W	NW	Mean Force 0-12.
A.M.		1	2	1	5	4	9	4	5	
P.M.		3	1	5	6	7	3	6		
Sun.		1	5	2	10	10	10	7	11	0

Observations made and
Return verified by

(Signed)

I regret that only when looking for fresh entries for Wet Bulb, that I found the Beaufort scale notice, within the last of Schedules about the middle of this month. P.H.

N.B.—Rain to be measured at 9 A.M. and the amount entered to the previous day.
See instructions on back of Schedule.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

In order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council requests the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD or TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bare or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUIT.	First in Blossom, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,		Cuckoo,		
Bountree or Elder,		Black Currant,		Curlow,		
Broom,		Cherry,		House-Swallow,		
Hazel,		Gean,		Lapwing,		
Hawthorn,		Gooseberry,		Plover,		
Holly,		Peach,		Sand-Martin,		
Laburnum,		Pear,		Starling,		
Lilac,		Plum,		Swan,		
Mezereum,		Strawberry,		Rail or Corn Crake,		
Mountain Ash or Rowan,						
Red Flowering Currant,						
Rhododendron Ponticum,						
Whin,						

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a lowered Stevenson Screen standing over grass and with its door facing north. The Dry and Wet Bulb Thermometers may be conveniently attached to upright laths near the front of the Screen, and the Maximum and Minimum Thermometers to others further back. The height of the Screen should be such that the bulbs of the Dry and Wet Thermometers are four feet above the ground. The Screen should be painted white inside and out.

MAXIMUM AND MINIMUM THERMOMETERS.

In order that the MAXIMUM THERMOMETER may register the highest temperature of the day, the column of mercury is disconnected from the mercury in the bulb either by an air-bubble in the column (Phillip's pattern), or by the narrowing of the tube near the bulb (Negretti and Zambra's pattern). In either case the instrument is set by holding it vertically, bulb downwards, and gently shaking and tapping it so as to send the portion of the column that remained at the highest point attained back towards the bulb.

The MINIMUM THERMOMETER registers the lowest temperature by an index enclosed in the column of spirit which is drawn towards the bulb as the temperature falls, but remains stationary during any rise of temperature. The lowest reading is therefore the position of the end of the index furthest from the bulb. The instrument is set by inclining it bulb upwards till the index slips down to the end of the column of spirit. Care must be taken not to force any part of the index beyond the end of the spirit. Should this occur, however, or should portions of the spirit get detached and lodge in the upper part of the tube, it is generally possible to set the instrument right again by grasping it near the end furthest from the bulb and giving several rapid vertical swings at arm's length, so as to drive the spirit and index towards the bulb by centrifugal force.

Both Maximum and Minimum should be read and set at 9 P.M. The readings should be written down before the Thermometers are touched; and after setting, both should agree very nearly with the Dry Bulb temperature at that hour. Any difference from the Dry Bulb of more than a degree may be regarded by the Observer as an indication either that the instrument is not properly set, or that it is out of order.

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. Muslins and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the previous day on the Schedule: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the notebook or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·43
·38
1·27

The total, 1·27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (—) should be entered on the Schedule rather than the figure 0.

Snow or Hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

ADDITIONAL REMARKS.

WIND, CLOUD, SUNSHINE, ETC.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example, Cir. W. 4 would indicate that four-tenths of the sky was covered with cirrus moving from the West and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M. to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M. and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

THE SECRETARY,

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Duthie Park Apperlywood, County of Shirddale, During the MONTH of September 1905.

Lat. 55° 9' N, Long. 2° 6' W, Distance from Sea 2 miles. Height of Cistern of the Barometer above Mean Sea-Level 44 feet, above Ground 4 feet.

Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches.

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				RAIN.	WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.					GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.			
	9 A.M.		9 P.M.		Protected in Screen, 4 feet above Ground.		Black Bulb Max. in Sun.	Min. on Grass.	9 A.M.		9 P.M.			9 A.M.		9 P.M.		9 A.M.		9 P.M.			9 A.M.									
	Barometer. No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	Max. No.	Min. No.			Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.		Amount at 9 A.M. inches.	Direc- tion.	Force, Scale of 0-12.	Direc- tion.	Force, Scale of 0-12.	9 A.M.	Species and Direction.	Amount (0-10).		Species and Direction.	Amount (0-10).	No. 3 ins.	No. 12 ins.	No. 22 ins.			No. 36 ins.	No. 48 ins.	
1	30.025	58.	29.775	58.	65.4	49.0			57.0	53.0	56.5	53.0	0.21	NW	1	NW	1		ci	8	2	10							Fair fine all day, rain after 5 p.m.	1		
2	29.700	59.	29.725	60.	59.6	52.6			58.2	53.0	57.5	57.0	0.18	NW	3	NW	1		cu	6	cu	10							very unsettled, slight rain afternoon	2		
3	29.460	60.	29.750	59.	65.2	52.4			58.0	57.0	52.6	50.0	0.06	N	1	NW	6		ci	5	cu	6							been heavy rain, then fair stormy showers P.M.	3		
4	29.860	56.	29.845	60.	69.2	48.0			54.7	53.8	58.6	56.0	0.04	SW	1	SW	0		n	10	ci	3							wet dull, fair and fine from 10 a.m.	4		
5	29.750	58.	29.750	60.	68.0	51.0			56.6	55.0	56.8	53.0	0.08	SW	1	SW	0		ci	8	cu	4							changeable, rain 10 a.m. to 2 p.m.	5		
6	29.740	59.	29.600	60.	63.9	51.5			57.0	53.0	56.4	52.0	0.00	SW	1	S	1		ci	6	n	10							fair & mild, slight rain 3 p.m.	6		
7	29.360	60.	29.200	59.	62.4	53.4			56.4	56.0	57.0	53.5	0.06	S	2	S	6		ci	7	cu	4							+ fog heavy rain 10.15 p.m. then fair	7		
8	29.330	54.	29.700	57.	62.2	51.8			55.0	50.1	53.2	51.4	0.00	SW	6	S	6		ci	8	ci	8							fine drying breeze all day -	8		
9	29.500	56.	29.325	54.	59.0	46.2			53.8	50.0	47.0	44.4	0.12	SW	4	SW	4		ci	5	cu	3							driving breeze, some rain 1 p.m. then fair	9		
10	29.300	56.	29.450	57.	63.0	41.8			52.9	49.4	54.0	48.0	0.03	SW	2	SW	2		cu	8	cu	6							dry dull, some rain then fair	10		
11	29.490	57.	29.750	55.	63.0	41.0			55.0	50.2	52.8	51.0	0.06	NW	2	NW	1		ci	6	cu	7							fine unsettled, some rain from 3 p.m.	11		
12	29.980	56.	29.750	58.	63.5	36.0			51.4	49.0	54.6	52.8	0.00	SW	1	SW	2		ci	8	ci	5							dull fair, fine drying day	12		
13	29.900	56.	30.150	57.	63.6	40.6			50.0	48.0	53.0	50.0	0.00	SW	2	SW	1		ci	5	ci	5							fair & fine all day	13		
14	30.300	56.	30.300	57.	59.2	40.2			50.4	46.4	48.2	46.5	0.05	NW	2	S	1		ci	4	ci	6							fair fine slight rain 3 p.m. then fair	14		
15	30.050	54.	30.090	57.	61.5	37.0			47.4	45.6	50.5	46.0	0.01	SW	2	NW	2		ci	6	ci	0							some slight rain, dull fair P.M.	15		
16	30.200	54.	30.275	56.	58.5	41.8			53.0	49.5	53.6	50.5	0.00	NW	4	SW	0		ci	8	ci	3							fair & fine all day.	16		
17	30.300	56.	30.300	54.	67.0	43.0			53.0	51.0	58.0	56.2	0.00						ci	2	ci	2							Do Do	17		
18	30.250	55.	30.105	59.	60.0	46.8			52.0	50.0	54.0	53.0	0.00	NW	1	SW	2		ci	3	ci	6							fair & fine all day	18		
19	29.910	57.	29.945	59.	60.7	51.8			55.0	52.5	52.5	52.0	0.00	S	4	S	0		n	10	ci	8							very dull all day	19		
20	30.150	57.	30.375	52.	60.8	36.1			44.0	42.5	44.0	42.0	0.00	SW	1	N	0			0	0								very dull fair all day	20		
21	30.400	48.	30.310	57.	60.0	34.8			42.8	41.5	53.0	51.4	0.00	S	1	SE	4			0	ci	6							White frost on grass, fair dull	21		
22	30.305	56.	30.225	56.	59.8	50.0			53.2	53.6	52.6	52.2	0.00	SE	2	SE	2		ci	6	ci	8							dull fair & fine all day	22		
23	30.175	57.	30.075	58.	58.6	51.0			54.0	52.2	50.4	48.4	0.10	SE	2	SE	1		ci	8	ci	3							slight rain, then fair fine	23		
24	29.950	57.	29.950	58.	58.4	44.8			53.5	51.0	53.0	50.0	0.20	ci	1	ci	2		ci	4	ci	6							been showers, now fine P.M.	24		
25	29.940	56.	29.900	57.	58.4	45.4			48.0	47.5	49.0	48.0	0.42	NW	2	N	2		n	10	n	10							heavy rain most of the day	25		
26	29.975	57.	29.975	58.	58.2	42.0			52.8	50.0	48.0	46.2	0.21	NW	4	NW	1		cu	6	0								heaviest heavy showers P.M.	26		
27	29.900	55.	30.025	57.	56.0	47.2			50.2	49.8	52.0	50.0	0.00	NW	2	NW	2		n	8	ci	6							showers most of the day	27		
28	30.275	56.	30.190	57.	55.5	48.8			53.0	49.8	52.0	50.0	0.00	NW	2	NW	2		ci	6	ci	5							fair fine all day	28		
29	30.250	55.	30.055	57.	58.2	49.0			55.0	52.5	50.0	47.0	0.06	NW	1	NW	4		ci	8	ci	14							fair Do Do	29		
30	30.040	53.	30.030	54.	50.0	41.0			46.4	43.7	45.0	42.4	0.05	NW	7	NW	4		cu	5	ci	2							Stormy showers cool.	30		
31																																
Sums.	1410.2	16	1311.6	17	159	1210			137	109	137	104								15		11										NOTATION USED IN GENERAL REMARKS.
Means.	29.932	55.4	29.932	57.2	60.8	45.8			52.7	50.4	52.7	50.3								6.0		5.2										
Correc- tions for Instru- mental Errors.	-0.10		-0.10																													
Correc- tions for Diurnal Range.																																
Cor- rected Means	29.922		29.922																													

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.850
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.846
 Mean at Station, corrected, and at 32°, = 29.848
 Correction for height, feet above Mean Sea-level, = + 49
 Mean, reduced to 32°, and Sea-level, = 29.897
 Highest Reading, corrected for Index error, on the 21 th, = 30.400
 Lowest Do. Do., on the 7 th, = 29.200
 Difference, or Monthly Range, = 1.200

S-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 11 th, = 69.2
 Lowest in Month, corrected for Index errors, on the 21 th, = 34.8
 Difference, or Monthly Range, = 34.4
 Mean of all the Highest, = 60.8
 Mean of all the Lowest, = 43.8
 Difference, or Mean Daily Range, = 15.0
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 53.5
 S-R. THERMOMETER, Min. on Grass, Lowest in Month, =
 " " Mean, =
 Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 52.7
 Wet Bulb, Mean of A.M. and P.M. Readings, = 50.3
 Computed Temperature of Dew-Point, = 47.9
 Do. Elastic Force of Vapour, = 334
 Do. Relative Humidity (Saturation = 100), = 84
 RAIN fell on 17 Days; Amount in Inches, = 1.94

WIND.		SUMMARY.							
Direction.		N	NE	E	SE	S	SW	W	NW
A.M.		-	5	1	2	3	10	1	7
P.M.		1	4	1	4	5	7	-	7
Sum.		1	9	2	6	8	17	1	14

Observations made and Return verified by Peter Harper
 (Signed) _____

N.B.—Rain to be measured at 9 A.M. and the amount entered to the previous day.
 See instructions on back of Schedule.

21
 45.19
 29.50
 53.9
 11

INSTRUCTIONS

IN order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the **BOARD OF TRADE** pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edges both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·365 one of the following is sometimes set down—viz. 30·365, 29·265, or 29·315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Out or Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Ripe generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,					Cuckoo,		
Bountree or Elder,		Apple,			Curlew,		
Broom,		Black Currant,			House-Swallow,		
Hazel,		Cherry,			Lapwing,		
Hawthorn,		Gean,			Plover,		
Holly,		Gooseberry,			Sand-Martin,		
Laburnum,		Peach,			Starling,		
Lilac,		Pear,			Swan,		
Mezeron,		Plum,			Rail or Corn Crane,		
Mountain Ash or Rowan,		Strawberry,					
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

FOR TAKING METEOROLOGICAL OBSERVATIONS.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*; thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st-January and 9 A.M. on 1st-February.

The measuring glass is divided to hundredths of an inch—the highest line indicating ·50, that is fifty hundredths or half an inch. The amount should be entered on the *Schedule* thus: if up to say the sixth line in the glass as ·06, if up to the twenty-third line as ·23, if up to the thirtieth line as ·30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering ·08 as simply 8, or ·30 as ·3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the notebook or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

47
42
38
—
1·27

The total, 1·27, would be entered on the *Schedule*.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (—) should be entered on the *Schedule* rather than the figure 0.

Snow or Hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

ADDITIONAL REMARKS.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the *Schedule*.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the *Schedule*. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W.	.	.	4
Cum. Str. S. W.	.	2	

 would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the *Schedule* are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Duthie Park, Aberdeen, County of Aberdeen, During the MONTH of October 1905.
Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 2 miles. Height of Cistern of the Barometer above Mean Sea-Level 44 feet, above Ground 4 feet.
Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches.
The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.		RAIN.	WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.					GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	9 A.M.		9 P.M.		Protected in Screen, 4 feet above Ground.		Black Ball Max. in Sun.	Min. on Grass.	9 A.M.			9 P.M.		9 A.M.		9 P.M.		Ane- nometer. 9 A.M.	9 A.M.		9 P.M.		9 A.M.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Barometer. No.	Attached Ther- mometer	Barometer. No.	Attached Ther- mometer	Max. No.	Min. No.			Dry bulb.	Wet bulb.		Dry bulb.	Wet bulb.	Amount at 9 A.M. inches.	Direc- tion.	Force. Scale of 0-12.	Direc- tion.		Force. Scale of 0-12.		Species and Direc- tion.	Amount (0-10).	Species and Direc- tion.	Amount (0-10).	No. 3 ins.			No. 12 ins.	No. 22 ins.	No. 32 ins.	No. 48 ins.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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1	29.825	53	29.805	57	50.5	43.8			48.2	47.6	44.6	43.0	0.22	NW	2	NW	4	h	8	Ci	5							1	1	Shower continuing most of the day																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
2	29.780	52	29.880	53	49.8	42.0			44.3	42.5	44.0	42.0	0.04	W	4	NW	1	Cu	4	Ci	6							2	2	Very unsettled																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
3	29.900	50	29.425	50	50.6	37.0			43.0	40.4	44.0	43.0	0.20	W	0	S	2	Ci	8	Ci	10							3	3	fair dull, rain from 2 P.m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
4	29.050	57	29.053	51	51.1	39.0			46.6	43.5	45.0	43.0	0.20	SW	2	NW	4	Ci	6	Ci	6							4	4	fair & fine																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
5	29.500	44	29.900	43	49.0	43.0			44.4	42.4	43.5	41.0	0.08	NW	2	NW	8	Ci	5	Cu	8							5	5	very stormy showers all day																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
6	30.100	48	30.200	63	47.0	38.5			42.0	39.0	43.0	40.0	0.00	NW	8	NW	8	Cu	8	Ci	8							6	6	very unsettled, fair																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
7	30.200	49	30.250	60	49.0	39.8			43.0	41.8	43.4	41.0	0.01	W	1	W	1	Ci	8	Ci	8							7	7	unsettled fair dull																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
8	30.300	50	30.300	53	56.8	40.0			41.6	40.4	42.0	40.0	0.00	W	1	W	2	Ci	8	Ci	8							8	8	fair dull slight showers P.m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
9	30.320	55	30.425	57	60.0	45.6			55.7	51.4	51.0	49.8	0.00	W	4	NW	1	Ci	6	Ci	6							9	9	fair & fine all day																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
10	30.500	53	30.550	58	58.0	50.0			53.0	51.0	52.0	50.0	0.00	NW	1	NW	1	Ci	6	Ci	8							10	10	fair & very fine all day.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
11	30.550	54	30.460	52	53.0	47.9			51.9	50.6	51.9	49.0	0.00	W	1	W	1	CL	8	Ci	8							11	11	fair dull all day																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
12	30.225	53	30.080	57	59.2	48.0			62.0	58.0	44.0	41.5	0.05	W	1	W	4	Ci	8	Ci	6							12	12	do do Showers P.m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
13	30.075	50	30.120	47	48.0	37.0			40.0	37.2	42.0	39.5	0.04	NW	6	NW	6	Ci	6	Ci	6							13	13	violent stormy showers, with squalls																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
14	29.850	47	29.500	49	50.5	34.2			45.5	42.1	40.0	40.0	0.14	NW	4	W	2	Ci	8	Ci	8							14	14	more settled, dull some rain																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
15	29.500	48	29.700	46	37.0	36.2			57.0	37.6	37.5	34.6	0.27	NW	2	NW	4	Ci	8	Ci	8							15	15	fair keen rain, slight showers day																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
16	29.855	45	29.970	48	42.6	34.0			38.8	33.0	38.1	36.0	0.02	NW	4	NW	4	Ci	5	Ci	5							16	16	fair cool,																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
17	29.950	46	29.960	42	42.6	34.4			40.0	37.8	38.5	36.0	0.07	NW	4	NW	2	Ci	10	Ci	6							17	17	been frequent showers of rain																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
18	30.450	45	30.200	47	44.0	34.0			37.8	36.0	39.0	35.0	0.02	NW	1	NW	1	Ci	2		0							18	18	Cool slight showers																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
19	30.350	45	30.405	48	46.0	33.1			39.0	32.2	39.5	37.0	0.00	NW	2	NW	1	Ci	2	Ci	2							19	19	fair cool																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
20	30.380	46	30.225	49	42.0	34.0			42.5	40.0	40.0	39.0	0.18	NW	2	NW	2	Ci	4	Ci	6							20	20	fair & fine cool P.m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
21	30.155	46	30.153	43	47.0	37.0			39.0	38.0	40.5	39.0	0.02	N	1	N	1	Ci	5	Ci	8							21	21	fair most of the day																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
22	30.175	46	30.210	47	46.8	36.0			44.5	41.0	41.0	40.0	0.03	N	2	N	2	Ci	4	Ci	8							22	22	fair some rain P.m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
23	30.250	48	30.290	50	47.0	42.0			44.0	42.8	42.5	41.0	0.16	NW	2	NW	2	Ci	8	Ci	8							23	23	showers frequent																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
24	30.275	47	30.280	48	48.6	40.0			42.6	42.0	42.0	41.0	0.25	NE	2	NE	2	Ci	8	Ci	8							24	24	showers heavy at times																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
25	30.290	47	30.175	50	49.4	39.8			41.2	40.0	42.0	40.0	0.03	NW	1	NW	1	Ci	6	Ci	8							25	25	fine all day.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
26	29.875	47	29.800	50	49.0	36.0			44.0	42.4	40.0	39.0	0.04	W	4	W	1	Ci	8		0							26	26	rain to 1 P.m. then fair																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
27	29.810	47	30.000	50	57.0	31.6			37.0	36.5	39.5	38.0	0.02	SW	1	W	4	Ci	2	Ci	6							27	27	white frost clear, dull later																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
28	30.000	46	29.680	50	42.5	35.7			38.8	37.6	39.0	38.5	0.28	W	1	W	2	Ci	6	Ci	10							28	28	fair, rain after 5 P.m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
29	29.450	43	29.350	57	48.8	37.0			40.1	37.7	41.5	40.0	0.08	SW	1	SE	1	Ci	0	Ci	5							29	29	fair clear fine all day																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
30	29.350	44	29.175	63	48.1	37.0			44.0	43.0	45.0	44.0	0.24	SE	2	NE	4	Ci	8	Ci	10							30	30	fair dull, rain after 1 P.m.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
31	29.160	44	29.245	53	53.0	44.0			46.7	45.4	46.0	45.4	0.27	NE	2	NE	2	Ci	10	N	10							31	31	rain frequent & heavy																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Sums.	13126	14	12114	13	177	166			137	119	125	133							193		209																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.905
Corrected Mean at 9 P.M., minus Correction for Temp. = 29.889
Mean at Station, corrected, and at 32°, = 29.897
Correction for height, feet above Mean Sea-level, = + 50
Mean, reduced to 32°, and Sea-level, = 29.947
Highest Reading, corrected for Index error, on the 10th, = 30.550
Lowest Do. Do., on the 4th, = 29.050
Difference, or Monthly Range, = 1.500

S-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 9th, = 60.0
Lowest in Month, corrected for Index errors, on the 27th, = 31.6
Difference, or Monthly Range, = 28.4
Mean of all the Highest, = 49.1
Mean of all the Lowest, = 38.8
Difference, or Mean Daily Range, = 10.3
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 44.0
S-R. THERMOMETER, Min. on Grass, Lowest in Month, = 31.6
" " Mean, = 44.0
Black Bulb, Max. in Sun, Highest in Month, = 60.0

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 43.4
Wet Bulb, Mean of A.M. and P.M. Readings, = 41.5
Computed Temperature of Dew-Point, = 39.3
Do. Elastic Force of Vapour, = 2.41
Do. Relative Humidity (Saturation = 100), = 85
Rain fell on 25 Days; Amount in Inches, = 2.96

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0-12.
A.M.		2	2		1		4	7	15		2.5
P.M.		2	3		1	1		7	17		2.5
Sum.		4	5	0	2	1	4	14	32	0	2.5

N.B.—Rain to be measured at 9 A.M. and the amount entered to the previous day.
See instructions on back of Schedule.

Observations made and Return verified by Peter Harper

(Signed)

INSTRUCTIONS

IN order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer; as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1-1000 inch, 0-100 inch, and 0-050 inch; that is to say, instead of 29-365 one of the following is sometimes set down—viz. 30-365, 29-365, or 29-315. Experience having shown that even the best Observers occasionally make these mistakes, the readings, after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divided or Leaves.	CROPS mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Out or Raised.
Alder,					Barley,				
Ash,					Bare or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Eye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,		Cuckoo,		
Bountree or Elder,		Black Currant,		Curlew,		
Broom,		Cherry,		House-Swallow,		
Hazel,		Gean,		Lapwing,		
Hawthorn,		Gooseberry,		Plover,		
Holly,		Peach,		Sand-Martin,		
Laburnum,		Pear,		Starling,		
Lilac,		Plum,		Swan,		
Mezeron,		Strawberry,		Rail or Corn Crane,		
Mountain Ash or Rowan,						
Red Flowering Currant,						
Rhododendron Ponticum,						
Whin,						

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

FOR TAKING METEOROLOGICAL OBSERVATIONS.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*; thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating .50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as .06, if up to the twenty-third line as .23, if up to the thirtieth line as .30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering .08 as simply 8, or .30 as .3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the notebook or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be—

.47
.49
.38
1.27

The total, 1.27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (—) should be entered on the Schedule rather than the figure 0.

Snow or hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges, such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

ADDITIONAL REMARKS.

WIND, CLOUD, SUNSHINE, ETC.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the Schedule.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Ch. W.	4
Cum. Str. S. W.	2

 would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M., but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M., and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

THE SECRETARY,

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Buthie Park Museum, County of Aberdeen, During the MONTH of November 1905.Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 2 miles. Height of Cistern of the Barometer above Mean Sea-Level 44 feet, above Ground 4 feet.Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches.

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.				RAIN.	WIND.				CLOUDS.				SUNSHINE.	THERMOMETERS under Ground.					GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.				
	9 A.M.		9 P.M.		Protected in Screen, 4 feet above Ground.		Black Bulb, Max. in Sun.	Min. on Grass.	9 A.M.		9 P.M.			Amount at 9 A.M.	9 A.M.		9 P.M.		Ane. inometer. 9 A.M.	9 A.M.			9 P.M.		9 A.M.								
	Barometer. No.	Attached Ther- mometer	Barometer. No.	Attached Ther- mometer	Max.	Min.			Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.	Direction.		Force. Scale of 0-12.	Direction.	Force. Scale of 0-12.	Species and Direction.		Amount (0-10).	Species and Direction.	Amount (0-10).	No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.						
																														inches.	°	inches.	°
1	29.350	50.	29.340	57.	50.0	46.2	X		44.0	42.2	45.0	44.0	0.42	NE	1	NE	1		ci	8	ci	8							Dull fair all day.	1			
2	29.310	57.	29.475	57.	50.2	42.8			50.0	49.0	49.0	48.5	0.36	SE	4	SE	2		ci	10	ci	10							heavy shower at 4 P.M. Rain most of day	2			
3	29.710	57.	29.800	57.	49.0	46.0			48.4	47.8	47.0	46.5	0.55	SE	2	SE	2		ci	10	ci	10							rain heavy at times, fair afternoon	3			
4	29.800	57.	29.800	54.	48.0	45.0			46.0	45.4	47.5	46.0	0.08	SE	1	SE	1		ci	10	ci	10							dull damp heavy rain afternoon	4			
5	29.650	51.	29.140	55.	49.0	36.8			48.0	47.0	47.5	46.0	0.26	SE	2	NE	6		ci	10	ci	10							heavy shower some improvement	5			
6	29.200	50.	29.150	52.	47.5	43.0			45.7	43.0	43.0	42.0	0.00	S	2	S	1		ci	8	ci	6							dull fair all day.	6			
7	29.275	50.	29.575	51.	49.0	41.5			45.2	43.0	43.0	42.5	0.08	SW	2	SW	2		ci	5	ci	10							fair, some rain after 1 P.M.	7			
8	29.885	49.	30.110	50.	45.0	41.0			42.2	40.8	39.5	37.0	0.03	W	1	W	1		ci	6	ci	0							rain frequent	8			
9	30.160	45.	30.150	49.	45.0	30.5			31.4	31.0	36.0	35.5	0.27	W	1	SE	1		ci	4	ci	8							fair, some rain after 1 P.M.	9			
10	30.000	46.	29.800	50.	43.0	34.0			34.6	34.0	37.5	36.0	0.05	S	1	S	4		ci	8	ci	8							rain frequent	10			
11	29.455	49.	29.200	48.	48.0	33.0			47.8	46.8	43.0	42.6	0.37	SE	6	SE	4		ci	10	ci	10							rain most of the day	11			
12	29.350	48.	29.350	59.	44.5	42.1			42.8	42.0	41.5	41.0	0.40	SE	4	SE	4		ci	10	ci	10							Do Do	12			
13	29.425	48.	29.695	49.	45.0	41.0			44.4	42.2	41.0	40.0	0.54	E	6	SE	6		ci	10	ci	8							frequent heavy showers	13			
14	29.775	46.	29.850	49.	43.0	37.4			39.1	38.0	37.5	37.1	0.10	NE	2	NE	2		ci	8	ci	8							heavy rain night, showers latter	14			
15	29.900	45.	29.950	48.	40.4	34.0			35.0	34.4	35.5	34.0	0.08	W	1	W	1		ci	7	ci	8							fair with remarkable clearness to 7 P.M.	15			
16	29.950	44.	29.975	46.	38.0	33.8			35.0	34.0	34.8	33.0	0.01	W	1	W	1		ci	4	ci	2							handsome rain, 5 showers	16			
17	30.055	43.	30.250	44.	37.1	32.4	X		34.0	32.8	26.0	25.0	0.00	W	1	W	1		ci	6	ci	4							very unsettled, showers latter, afternoon	17			
18	30.250	39.	30.145	42.	32.5	23.2			24.0	23.0	25.0	24.0	0.00	W	1	W	1		ci	0	ci	0							fair more settled, hand frost	18			
19	29.840	31.	29.725	41.	38.4	20.5			26.8	25.8	34.8	34.0	0.05	SW	1	SW	1		ci	5	ci	8							fair more fresh	19			
20	29.900	41.	30.000	43.	41.0	34.2			34.8	34.0	35.0	34.5	0.00	W	1	SW	1		ci	2	ci	0							fair fine all day	20			
21	29.960	43.	29.990	46.	42.0	26.0			27.8	27.0	34.5	33.0	0.00	SW	1	SW	1		ci	0	ci	0							white frost fair	21			
22	29.685	44.	29.325	48.	52.2	32.2			43.4	41.2	47.5	46.1	0.03	SW	4	SW	8		ci	8	ci	10							showery and dull	22			
23	29.400	43.	29.340	47.	46.4	35.6	X		36.2	35.0	39.0	36.2	0.00	SW	1	SW	2		ci	0	ci	0							fair fine	23			
24	29.450	44.	29.500	46.	42.6	30.0			34.8	33.0	36.0	35.0	0.00	SW	2	SW	2		ci	3	ci	2							Do Do frost rain	24			
25	29.450	46.	29.350	48.	44.2	31.0			44.8	39.8	34.0	32.0	0.00	SW	2	SW	1		ci	8	ci	8							Do Do	25			
26	29.050	48.	28.725	51.	46.0	43.0			45.2	44.6	44.6	43.0	0.96	S	1	SE	2		ci	10	ci	10							dull heavy rain from 10 P.M.	26			
27	29.050	44.	29.300	46.	41.2	35.0			37.4	33.8	35.0	32.8	0.00	W	8	W	4		ci	0	ci	5							fair breeze	27			
28	29.500	43.	29.450	46.	38.2	28.4			30.5	29.8	32.6	30.0	0.00	SW	1	W	1		ci	2	ci	0							fair clear frost P.M.	28			
29	30.050	41.	29.920	46.	43.0	36.0			38.8	36.5	38.5	36.0	0.20	W	1	S	4		ci	3	ci	5							fair frosty, rain P.M.	29			
30	29.700	39.	29.775	48.	43.4	36.0			41.7	40.8	42.5	40.0	0.13	S	4	SW	2		ci	10	ci	2							rain from early morning clearing P.M.	30			
31																																	
Sums.	14113	12	15114	14	192.8	114			2662	2377	2731	233	496		66		70			155	180												
Means.	29.651	45.4	29.646	48.6	44.1	35.7			38.9	37.9	39.1	37.8			2.2		2.3			6.2	6.0												
Corrections for Instrumental Errors.	-0.60		-0.10																														
Corrections for Diurnal Range.																																	
Corrected Means																																	

BAROMETER. Corrected Mean at 9 A.M. minus Correction for Temp. = 29.597 597
Corrected Mean at 9 P.M. minus Correction for Temp. = 29.583 583
Mean at Station, corrected, and at 32° = 29.610 590
Correction for height, feet above Mean Sea-level, = + 50
Mean, reduced to 32°, and Sea-level, = 29.640
Highest Reading, corrected for Index error, on the 17th, = 30.250
Lowest Do. Do., on the 26th, = 28.725
Difference, or Monthly Range, = 1.525

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 22th, = 52.2
Lowest in Month, corrected for Index errors, on the 19th, = 20.5
Difference, or Monthly Range, = 31.7
Mean of all the Highest, = 44.1
Mean of all the Lowest, = 35.7
Difference, or Mean Daily Range, = 8.4
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 39.9
S.-R. THERMOMETER, Min. on Grass, Lowest in Month, = 20.5
Mean, = 39.9
Black Bulb, Max. in Sun, Highest in Month, = 52.2

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 39.0
Wet Bulb, Mean of A.M. and P.M. Readings, = 37.8
Computed Temperature of Dew-Point, = 36.2
Do. Elastic Force of Vapour, = 214
Do. Relative Humidity (Saturation = 100), = 90
RAIN fell on 20 Days; Amount in Inches, = 4.96

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0-12.
A.M.		1	2	1	6	4	8	4	4		
P.M.		3	3	8	3	9	1	3			
Sum.		4	5	1	14	7	17	5	7		2.3

Observations made and
Return verified by

(Signed)

N.B.—Rain to be measured at 9 A.M. and the amount entered to the previous day.
See instructions on back of Schedule.

INSTRUCTIONS

IN order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the BOARD OF TRADE pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1/1000 inch, 0.100 inch, and 0.050 inch; that is to say, instead of 29.365 one of the following is sometimes set down—viz. 30.365, 29.265, or 29.315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First Out or Raised.
Alder,					Barley,				
Ash,					Bare or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	Fruit Buds generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bouree or Elder,		Black Currant,			Curlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezerion,		Strawberry,			Rail or Corn Orale,		
Mountain Ash or Rowan,							
Red Flowering Currant,							
Rhododendron Ponticum,							
Whin,							

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

FOR TAKING MÉTÉOROLOGICAL OBSERVATIONS.

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*; thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st-January and 9 A.M. on 1st-February.

The measuring glass is divided to hundredths of an inch—the highest line indicating .50, that is fifty hundredths or half an inch. The amount should be entered on the *Schedule* thus: if up to say the sixth line in the glass as .06, if up to the twenty-third line as .23, if up to the thirtieth line as .30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering .08 as simply 8, or .30 as .3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the notebook or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

.47
.49
.38
1.27

The total, 1.27, would be entered on the *Schedule*.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (—) should be entered on the *Schedule* rather than the figure 0.

Snow or hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

ADDITIONAL REMARKS.

WIND, CLOUD, SUNSHINE, ETC.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale given on the other side of the *Schedule*.

At Stations where an Anemometer is in use, the readings at 9 A.M. each day should be put down in the column provided, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the *Schedule*. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example, Cir. W. 4 would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A MAXIMUM THERMOMETER, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A MINIMUM THERMOMETER on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M. but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M. and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the *Schedule* are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Duthie Park, Aberdeen, County of Aberdeen, During the MONTH of December 1905.
Lat. 57° 9' N, Long. 2° 6' W, Distance from Sea 2 miles. Height of Cistern of the Barometer above Mean Sea-Level 44 feet, above Ground 4 feet.
Diameter of Rain Gauge 5 inches. Height of Rim of Gauge above Ground 12 inches.

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M.				HYGROMETER.				RAIN.	WIND.				CLOUDS.				SUNSHINE.	THERMOMETERS under Ground.						GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. Mention the hour at which Storms, including Thunder and Lightning, began and ended.	Days of Month.				
	9 A.M.		9 P.M.		Protected in Screen, 4 feet above Ground.		Black Bulb Max. in Sun. No.	Min. on Grass. No.	9 A.M.		9 P.M.			Amount at 9 A.M.	9 A.M.		9 P.M.		Anemometer. 9 A.M.	9 A.M.			9 P.M.		9 A.M.									
	Barometer. No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	Max. No.	Min. No.			Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.			Direction.	Force. Scale of 0-12.	Direction.	Force. Scale of 0-12.		Species and Direction.	Amount (0-100).		Species and Direction.	Amount (0-100).	No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.			No. 48 ins.			
																																inches.	°	inches.
1	29.925	45.	29.945	46.	48.0	37.0			38.8	37.8	48.0	46.0	0.00	SW	1	SW	0		Ci	5	Ci	8									fair, dull all day	1		
2	29.975	50.	30.050	57.	53.0	47.6			51.6	48.8	57.0	47.0	0.00	SW	6	SW	6		Ci	8	Ci	4									fair, drying all day	2		
3	30.100	57.	30.105	53.	52.0	48.4			50.0	48.0	47.0	46.0	0.00	SW	4	SW	2		Ci	4	Ci	0									fair & fine all day	3		
4	30.075	50.	29.950	57.	51.0	43.1			44.4	43.5	46.0	44.0	0.00	SW	1	SW	1		Ci	3	100.										fair & fine, fog P.M.	4		
5	29.620	49.	29.375	52.	47.0	44.5			46.0	43.7	42.0	40.0	0.04	S	6	SW	1		N	10											dull damp wind, clear P.M.	5		
6	29.350	48.	29.450	57.	50.0	37.0			42.4	40.0	45.0	43.0	0.02	S	1	SW	2		Ci	8	Ci	8									fair dull, mild,	6		
7	29.350	48.	29.575	51.	50.0	37.0			44.0	40.0	42.0	40.0	0.00	SW	2	SW	4		Ci	2	Ci	2									fair & fine all day	7		
8	29.640	48.	29.765	49.	45.0	38.8			40.0	37.0	39.0	36.0	0.00	SW	4	SW	2			0	Ci	3									Do Do	8		
9	29.800	45.	30.200	48.	42.5	35.2			38.1	35.1	38.0	35.2	0.00	SW	2	SW	2			0	0										Do Do	9		
10	30.445	43.	30.350	47.	42.0	29.0			31.6	30.0	42.0	40.8	0.00	SW	1	SW	4		Ci	2	Ci	8									Do fresh wind P.M.	10		
11	30.300	44.	30.660	49.	48.0	41.0			46.5	42.0	42.4	39.0	0.02	SW	6	NW	1		Ci	8	Ci	6									fair fresh breeze, fine settled P.M.	11		
12	30.820	43.	30.725	43.	48.0	30.0			31.0	29.0	29.5	28.0	0.00	SW	1	SW	1			0	0										fair & fine all day	12		
13	30.600	37.0	30.505	49.	49.0	25.2			28.9	27.8	46.2	44.4	0.00	SW	1	SW	1			0	Ci	8										Do Do soft towards night	13	
14	30.425	45.	30.300	49.	48.0	37.6			38.6	37.5	39.5	38.0	0.00	NW	1	NW	1		Ci	4	Ci	8										fair & fine all day	14	
15	30.105	47.	30.200	50.	57.0	32.0			46.2	45.8	42.0	40.4	0.09	NW	1	NW	1		Ci	6	N	10										fair dull, slight rain after 2 P.M.	15	
16	30.200	47.	30.300	50.	47.0	37.0			41.0	40.0	42.0	41.0	0.20	NW	1	NW	1		N	10	N	10										dull damp haze continuing	16	
17	30.300	47.	30.220	50.	45.0	41.0			44.1	43.6	44.0	43.0	0.01	S	1	S	2		N	10	N	10										very dull & damp all day	17	
18	30.100	47.	29.925	50.	44.0	40.4			42.5	40.2	43.0	41.8	0.15	S	2	S	4		Ci	8	Ci	8										fair all day gloomy	18	
19	29.570	47.	29.700	47.	44.0	40.0			42.0	41.0	37.0	35.8	0.12	SW	4	SW	4		N	10	0											rain, fair from 12 noon	19	
20	29.850	44.	29.775	49.	47.5	35.0			37.4	36.0	47.0	45.0	0.00	SW	2	SW	4		Ci	6	Ci	8										fair mild all day	20	
21	29.950	47.	30.050	52.	47.0	42.5			44.1	42.7	45.4	44.6	0.01	SW	1	SW	1		Ci	6	Ci	8										Do Do	21	
22	30.100	43.	30.125	50.	48.0	43.0			48.0	46.0	46.0	44.0	0.00	SW	4	SW	2		Ci	8	Ci	6										Do Do	22	
23	30.100	47.	30.055	49.	45.0	32.0			45.0	41.5	41.5	40.0	0.00	SW	4	SW	2		Ci	5	0											Do Do	23	
24	30.100	47.	30.050	50.	44.5	36.2			43.8	42.0	44.5	41.0	0.05	SW	2	SW	2		Ci	5	Ci	8										Do Do	24	
25	29.980	46.	30.100	48.	41.5	39.0			40.0	39.5	32.0	31.5	0.02	SW	2	SW	2		N	10	0											become rain, dull cold fog	25	
26	30.100	43.	30.000	49.	45.0	28.0			33.2	32.0	44.5	44.0	0.03	S	1	S	2		N	10	N	10										damp all day	26	
27	29.875	47.	29.700	49.	42.0	39.0			42.0	39.8	41.0	39.0	0.00	SW	1	S	2		N	10	N	10										dull all day	27	
28	29.650	44.	29.575	50.	42.5	39.2			41.0	38.8	42.2	39.0	0.00	SE	2	SE	1		N	10	N	10										Do Do	28	
29	29.525	47.	29.840	48.	43.4	40.0			43.5	41.0	40.0	38.5	0.04	E	2	E	2		N	10	Ci	6										dull fair some slight rain	29	
30	30.120	44.	30.300	45.	41.0	31.1			33.0	32.2	36.0	34.0	0.09	E	1	SW	1		Ci	8	Ci	8										become snow fair all day	30	
31	30.250	43	30.150	46.	40.4	36.0			39.5	36.6	36.5	36.6	0.00	SE	6	SE	6		N	10	Ci	8										dull fair cool all day	31	
Sums.	1474	16	1316	4	133	154			28	139	144	135									187													
Means.	30.006	45.9	30.033	45.9	46.2	37.5			41.2	38.9	42.0	40.2			2.39		2.16				63													
Corrections for Instrumental Errors.	-0.10		-0.10																		60													
Corrections for Diurnal Range.																																		
Corrected Means	29.996		30.023																															

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.996
Corrected Mean at 9 P.M., minus Correction for Temp. = 30.023
Mean at Station, corrected, and at 32°, = 29.962
Correction for height, feet above Mean Sea-level, = + 60
Mean, reduced to 32°, and Sea-level, = 30.012
Highest Reading, corrected for Index error, on the 12 th, = 30.810
Lowest Do. Do., on the 6 th, = 29.340
Difference, or Monthly Range, = 1.470

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 2nd th, = 53.0
Lowest in Month, corrected for Index errors, on the 13 th, = 25.2
Difference, or Monthly Range, = 27.8
Mean of all the Highest, = 46.2
Mean of all the Lowest, = 37.5
Difference, or Mean Daily Range, = 8.7
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 41.8
S.-R. THERMOMETER, Min. on Grass, Lowest in Month, =
" " Mean, =
Black Bulb, Max. in Sun, Highest in Month, =

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 41.6
Wet Bulb, Mean of A.M. and P.M. Readings, = 39.5
Computed Temperature of Dew-Point, = 36.9
Do. Elastic Force of Vapour, = 22.0
Do. Relative Humidity (Saturation = 100), = 84
RAIN fell on 14 Days; Amount in Inches, = 0.89

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0-12.
A.M.		0	0	2	2	5	19	2	1	0	
P.M.		0	1	1	2	4	20	1	2	0	
Sum.		0	1	3	4	9	39	3	3	0	2.3

Observations made and
Return verified by Peter Harper

(Signed)

N.B.—Rain to be measured at 9 A.M. and the amount entered to the previous day.
See instructions on back of Schedule.

INSTRUCTIONS

IN order to insure uniformity in the observations made at the Observing Stations of the Scottish Meteorological Society, the Council request the Observers to adopt the methods described below.

HOURS OF OBSERVATION.

The Council recommend that Observations be made precisely at 9 A.M. and 9 P.M. (Greenwich Time). At both hours the Barometer and Dry and Wet Bulb Thermometers should be read, and notes made of the Wind, Cloud, and general weather. The Rain Gauge should be read at 9 A.M. only, and the Maximum and Minimum Self-registering Thermometers at 9 P.M. only.

It is hoped that every effort will be made to insure punctuality. When, however, an observation is taken not at the usual hours, it is requested that this be stated in a note on the Schedule.

All instruments used should be compared with a certified standard; Observers are requested to communicate with the Secretary before purchasing new or repairing old instruments.

BAROMETER.

The Barometer should be hung in a good light and in a room not exposed to sudden changes of temperature. The upper part of the scale must not be higher than the level of the observer's eye, and the instrument must hang vertically. Barometers should not be moved from their places except by persons accustomed to the work, as they are very liable to get air into the mercury column when improperly handled. Mercurial barometers mounted in metal cases are the only sort suitable for the accurate measurement of atmospheric pressure.

FORTIN BAROMETER.—In setting this instrument the level of the mercury in the glass cistern has first to be adjusted by turning the screw below the cistern till the surface of the mercury just touches the ivory point which projects downwards from the cover of the cistern. A modification of the Fortin pattern is used at several of the Society's Stations, in which the adjustment is made by turning the screw until the zero line on an ivory rod which projects through the cover of the cistern is brought to coincide with the lines on the uprights beside it. In either pattern this cistern adjustment must be made before the Vernier at the top of the mercury column is set.

In the **BOARD OF TRADE** pattern of barometer no adjustment of the cistern is required, and the Observer can at once proceed to set the Vernier, which in all three classes of instrument is done as follows:—

First see that the Vernier is raised above the mercury, then lower it till its front and back edge both just touch, that is, form a tangent to, the highest part of the mercury column. The top of the mercury is usually slightly convex, and care must be taken not to bring the Vernier down to where the front of the mercury touches the glass, which is below the real top of the column.

The attached thermometer should be read and noted before setting the barometer, as its readings may be affected by heat from the Observer's body while handling the instrument.

The errors most frequently made in reading the barometer are mistakes of 1/1000 inch, 0.100 inch, and 0.050 inch; that is to say, instead of 29.365 one of the following is sometimes set down—viz. 30.365, 29.265, or 29.315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES	In Flower.	Leaf buds first appear.	In Leaf.	Divested of Leaves.	CROPS mentioning variety.	Sowing or Planting.	Appearing above ground.	In Ear or Flower.	First Out or Raised.
Alder,					Barley,				
Ash,					Bare or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

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

The Society will be glad to receive any portions of the information indicated in this table that may come under the Observer's notice.

FOR TAKING METEOROLOGICAL OBSERVATIONS

RAIN GAUGE.

The Rain Gauge should be read at 9 A.M. each day, and the amount entered to the *previous day on the Schedule*: thus the quantity measured at 9 A.M. on the 5th should be put down on the line containing the observations of the 4th of the month, since out of the twenty-four hours ending at 9 A.M. on 5th, fifteen belong to the 4th and only nine to the 5th, so that the amount may more properly be credited to the former day. The monthly total for, say, January is thus what falls between 9 A.M. on 1st January and 9 A.M. on 1st February.

The measuring glass is divided to hundredths of an inch—the highest line indicating .50, that is fifty hundredths or half an inch. The amount should be entered on the Schedule thus: if up to say the sixth line in the glass as .06, if up to the twenty-third line as .23, if up to the thirtieth line as .30, and so on, there being always two figures put down to the right of the decimal point. Care should be taken to avoid entering .08 as simply 8, or .30 as .3, as this may cause confusion when adding the figures to get the total for the month.

When the fall exceeds one fill of the measuring glass it is necessary to measure it in portions, and each successive reading should be jotted down on the flyleaf of the notebook or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

.47
.49
.38
1.27

The total, 1.27, would be entered on the Schedule.

The glass must be held vertically or placed on a level surface when reading. A little uncertainty is sometimes caused by the upward curvature of the water where it touches the side of the glass, but the true reading is half way between the two apparent edges of the water surface. When there is nothing in the gauge a stroke (—) should be entered on the Schedule rather than the figure 0.

Snow or Hail is counted as Rainfall, and should be melted and measured as such. The upper part of the gauge may be taken indoors, and what is lying in it thawed. To save time, especially if snow or rain be then falling, it is convenient to add a measured quantity of warm water to the snow in the gauge, this quantity being afterwards deducted from the total to get the amount that has fallen. The depth of snow lying on the ground should be noted in the Remarks column.

In gauges such as Flemings, in which a float and measuring rod is used, the rod should be removed or tied down below the level of the rim, except when a measurement is being taken, because if allowed to project above the gauge, it would prevent it catching the true amount of fall.

If a gauge is only read once a month this should be done on the morning of the 1st, and the amount entered to the previous month.

The Rain Gauge should be placed in an open situation, if possible with no elevated objects close to it, in any case trees, walls, etc., should never be nearer to the gauge in horizontal distance than their own height. The gauge should be firmly fixed with its rim 12 inches above ground; if surrounded by grass, care must be taken that it is never allowed to grow as high as the rim. The gauges at most Stations are five inches in diameter, though a few of larger or smaller size are also in use. A convenient way of fixing a gauge in position is to drive four stout wooden pegs from 12 to 18 inches long into the ground, one at each side of the gauge.

WIND, CLOUD, SUNSHINE, ETC.

WIND.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations, where the true direction cannot be easily observed, it is best to ascertain this by watching the movement of smoke from chimneys, or even of the lower clouds. The force of the wind should be noted according to the scale on the back of the Schedule.

At Stations where an Anemometer is in use, readings at 9 A.M. each day should be put down on the Schedule, the values being entered to the previous day, as in the case of the Rainfall.

CLOUDS.

The amount of Cloud should be estimated on the scale, 0 to 10, 0 indicating a clear and 10 an overcast sky. Only the part of the sky over 30° above the horizon should be taken into account, as it is impossible to estimate the space covered by Clouds nearer the horizon. A convenient table for noting briefly the species of Cloud will be found on the other side of the Schedule. It is desirable to note, if possible, the direction from which the Clouds are moving. If there is more than one layer of clouds on the sky, they should be noted.

Thus, for example,

Cir. W.	4
Cum. Str. S.W.	2

 would indicate that four-tenths of the sky was covered with cirrus moving from the West, and two-tenths with cumulus moving from the S.W.

SUNSHINE.

This column is primarily for those Stations where a Sunshine Recorder is kept; at other Stations, however, the Observer may note in it the number of hours each day that the sun shines with sufficient clearness to cast a distinct shadow.

RADIATION THERMOMETERS.

A **MAXIMUM THERMOMETER**, with its bulb blackened and enclosed in an outer glass bulb exhausted of air, is used at many stations to register the highest temperature in the sun. It should be mounted horizontally about four feet above ground with its bulb pointing south, and should be read and set at 9 P.M.

A **MINIMUM THERMOMETER** on grass is used to register the lowest radiation temperature at night. It should be placed on wooden supports a few inches above the surface of the grass. It may be read and set at 9 P.M. but in warm weather, as the spirit in this instrument is liable to evaporate when exposed to bright sunshine and to condense again in the upper part of the tube, it is better to read it at 9 A.M., to put it inside the screen during the day, and to set and replace it at 9 P.M.

THERMOMETERS UNDER GROUND.

These should be read at 9 A.M. and the readings entered on the day on which they are made.

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; of Fogs, Gales or Storms, and generally of all noteworthy Weather phenomena.

The table and additional lines on the back of the Schedule are for the use of those Observers who wish to record Notes connected with the changes of the Seasons, such as the growth of Crops, Fruit, etc., and the migrations of Birds; also the prevalence of Diseases in man, in the lower animals, and in plants. Such observations are often of great interest and utility when taken in conjunction with the ordinary Meteorological records.

ADDITIONAL REMARKS.

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122 George Street,

EDINBURGH.

BOOK POST.

