

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Duthie Park Aberdeen, County of Aberdeen, During the MONTH of January 1906.
 Lat. 57° 9' N., Long. 2° 16' 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.	Direc- tion.	Force, Scale of 0-12.	Direc- tion.	Force, Scale of 0-12.	Ane- moneter. 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.							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.						
																															inches.	°	inches.	°
1	30.030	44	29.970	46	46.8	36.0			40.5	36.7	46.0	40.0	0.00	SE	6	SE	6		ci	8	ci	8								fair cool dull all day	1			
2	29.800	45	29.750	44	43.0	42.0			42.0	40.0	41.5	40.0	0.17	SE	8	SE	6		n	10	N	10								fair cool, rain from noon	2			
3	29.640	45	29.550	48	43.0	40.2			41.6	40.0	41.5	41.0	0.34	SE	6	SE	6		n	10	N	10								heavy rain from 4 P.M.	3			
4	29.550	46	29.550	44	44.5	40.0			42.3	41.8	38.8	37.0	0.13	SW	1	SE	1		ci	8		fog								dull fair mild all day	4			
5	29.550	45	29.655	47	42.0	35.5			37.0	35.0	32.0	31.0	0.14	SW	1	N	1		ci	3											fair mild frost clear P.M.	5		
6	29.350	45	29.490	47	41.6	29.0			40.0	40.0	40.0	39.0	0.07	SE	1	N	1		ci	5											rain, 2 P.M. rain	6		
7	29.500	40	29.350	46	38.0	29.5			39.0	31.8	31.0	30.0	0.00	SW	1	N	1		ci	5											fair white frost holding all day	7		
8	29.340	39	29.800	45	35.0	27.8			32.5	31.5	32.8	32.0	0.00	SW	1	SW	1		fog			ci	6								fast fog rain all day	8		
9	29.155	43	28.800	45	43.0	29.0			40.0	39.5	40.3	39.0	0.07	S	4	SE	4		ci	8		ci	8								fair dull some rain then fair	9		
10	29.040	44	29.605	46	43.0	41.0			43.0	39.0	36.0	34.0	0.00	N	4	N	1		ci	6											fair drizzly and fine all day	10		
11	29.760	41	29.250	46	44.0	29.0			37.0	36.7	36.0	35.0	0.00	N	2	SW	6		ci	6		ci	8								fine some rain P.M.	11		
12	29.400	41	29.400	45	39.6	30.0			36.0	34.0	37.4	36.0	0.00	SW	4	SW	1		ci	2		ci	3								fine all day slight frost P.M.	12		
13	29.200	43	29.375	45	40.0	32.5			34.0	32.9	34.8	33.0	0.00	SW	1	SW	1		ci	4											fine all day	13		
14	29.600	42	29.350	43	47.5	32.0			37.2	35.4	47.0	46.0	0.00	SW	2	SW	5		ci	6												fair slight frost, gal. after dusk	14	
15	29.350	45	29.325	42	44.0	36.2			44.0	41.4	36.0	35.0	0.00	SW	4	SW	1		ci	8		ci	3								fresh fair all day	15		
16	29.375	43	29.200	45	38.0	33.9			35.5	33.5	35.0	33.0	0.00	S	2	SW	1		ci	2												fair fine all day cold	16	
17	29.280	40	29.580	46	43.0	31.5			38.4	35.0	39.0	36.0	0.00	SW	4	SW	4		ci	5		ci	3									do do do	17	
18	29.485	40	29.550	43	38.0	31.4			37.7	30.7	36.0	35.0	0.15	SW	1	N	2		ci	5		ci	3									fair cold clear slight P.M.	18	
19	30.150	40	30.350	41	38.0	31.0			37.2	36.0	36.0	34.0	0.06	NW	6	NW	4		ci	10												wild stormy rain showers P.M.	19	
20	30.220	42	29.900	46	42.8	31.0			39.1	36.5	43.0	40.0	0.01	N	1	SW	2		ci	10		ci	2									fair mild clear	20	
21	30.250	44	30.525	45	43.0	40.2			42.7	40.4	42.0	41.0	0.00	N	2	SW	1		ci	4												do do	21	
22	30.550	39	30.529	44	40.0	30.8			32.0	30.5	32.0	30.8	0.00	SW	2	SW	2		ci	4												do do	22	
23	30.425	42	30.300	46	43.0	29.8			34.0	33.0	38.5	31.0	0.00	SW	1	SW	2		ci	4												do do	23	
24	30.000	44	29.450	48	45.0	33.0			42.5	41.0	45.0	43.0	0.04	E	6	SW	6		ci	10		ci	10									dull all day some rain P.M.	24	
25	29.450	44	29.500	43	47.2	34.2			35.6	33.8	41.8	38.0	0.00	SW	1	SW	2		ci	2		ci	5									fair fine all day	25	
26	29.575	46	29.525	41	56.2	23.0			43.2	44.0	57.0	46.0	0.00	N	1	N	4		ci	2		ci	3									fair very fine, (high temperature)	26	
27	29.500	49	29.700	50	48.2	44.0			45.0	39.2	46.0	45.2	0.00	N	4	SW	4		ci	4		ci	5									do do	27	
28	29.470	50	29.900	52	53.0	42.0			52.6	47.4	41.0	39.0	0.27	N	6	NW	1		ci	4		ci	10									fair very fine, rain from 8 P.M.	28	
29	29.850	44	29.975	48	42.0	34.6			35.6	35.0	39.0	36.0	0.00	NW	2	NW	1		ci	10												been rain now fair fine	29	
30	30.500	45	30.200	45	45.0	33.8			40.2	36.6	40.0	36.4	0.00	N	4	NW	2		ci	2		ci	5									fair fine all day	30	
31	30.175	44	30.010	48	45.2	32.0			36.0	33.8	42.0	41.0	0.06	SW	1	SW	2		ci	4		ci	8									fair very fine some rain P.M.	31	
Sums.	1243	11	16105	15	144	117			128	1212	124	121	1.50																					
Means.	21.230	10.4	21.174	17.6	106.5	129.9			27.0	211.6	276.6	213.4	1.50																					
Corrections for Instrumental Errors.	29.685	43.4	29.683	45.7	43.4	34.2			38.9	36.8	38.9	36.9																						
Corrections for Diurnal Range.																																		
Corrected Means	29.675		29.673																															

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-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.

0 Calm.

1 Light Air.

2 Light Breeze.

3 Gentle Breeze.

4 Moderate Breeze.

5 Fresh Breeze.

6 Strong Breeze.

7 Moderate Gale.

8 Fresh Gale.

9 Strong Gale.

10 Whole Gale.

11 Storm.

12 Hurricane.

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.675
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.673
 Mean at Station, corrected, and at 32°, = 29.631
 Correction for height, feet above Mean Sea-Level, = + 50
 Mean, reduced to 32°, and Sea-level, = 29.681
 Highest Reading, corrected for Index error, on the 22nd, = 30.540
 Lowest Do. Do., on the 9th, = 28.790
 Difference, or Monthly Range, = 1.750

S-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 26th, = 56.2
 Lowest in Month, corrected for Index errors, on the 29th, = 29.0
 Difference, or Monthly Range, = 27.2
 Mean of all the Highest, = 43.4
 Mean of all the Lowest, = 34.2
 Difference, or Mean Daily Range, = 9.2
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 38.8
 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, = 38.9
 Wet Bulb, Mean of A.M. and P.M. Readings, = 36.8
 Computed Temperature of Dew-Point, = 23.8
 Do. Elastic Force of Vapour, = 196
 Do. Relative Humidity (Saturation = 100), = 84
 RAIN fell on 12 Days; Amount in Inches, = 1.50

WIND.		SUMMARY.							
Direction.		N	NE	E	SE	S	SW	W	NW
A.M.		1	0	1	4	2	4	7	2
P.M.		3	0	0	5	0	16	3	4
Sum.		4	0	1	9	2	30	10	6

Observations made and Return verified by Peter Sharpen
 (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 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. Mercarial 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.	Directed 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,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom.	First in Blossom generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Chukoo,		
Bountree 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,		
Mezaron,		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.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a towered 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 .05 as simply 5, 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.

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 February 1906.
Lat. 57. 9 N, Long. 3. 2 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.		Anemometer. 9 A.M.	9 A.M.		9 P.M.			9 A.M.														
	Barometer.	Attached Ther- mometer.	Barometer.	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 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.										
	No.	inches.	°	No.	inches.	°	°	No.	°	No.	°	inches.	°	°	°	°	°	°	°	°	°	°		°	°	°	°											
1	29.950	45.	29.750	48.	48.0	35.1	37.5	35.1	37.5	35.1	37.5	35.1	37.5	0.00	N	2	N	1									fair & very fine all day	1										
2	29.600	44.	29.640	45.	37.4	34.8					35.4	34.4	35.0	34.0	0.14	N	4	N	4									sleet showers frequent all day	2									
3	29.575	42.	29.740	44.	39.0	32.0					35.0	32.2	34.0	32.2	0.15	N	6	N	6									Do Do Do	3									
4	30.150	37.	30.300	44.	37.0	31.1					33.0	31.8	35.0	33.0	0.02	N	4	N	2										snow showers after noon	4								
5	30.250	40.	30.100	44.	36.0	27.5					30.0	27.5	36.0	34.8	0.00	SW	1	SW	1										dull fair & fine	5								
6	29.990	42.	30.100	44.	45.8	34.5					33.8	32.8	38.4	36.0	0.01	SW	2	N	2											dull fair & fine	6							
7	30.107	42.	30.007	44.	45.4	34.0					41.0	36.0	37.4	36.2	0.00	N	3	N	4											fair cold & wind	7							
8	29.250	42.	29.362	44.	39.6	38.0					39.5	36.0	37.5	35.5	0.04	N	6	N	4												stormy showers	8						
9	29.675	38.	29.626	38.	35.0	25.4					28.1	26.7	28.1	26.0	0.15	N	6	N	4												Do Do	9						
10	28.800	40.	28.510	43.	39.8	31.0					36.2	36.1	35.0	34.2	0.48	SE	4	S	2												soft rain fair after 2 P.m.	10						
11	29.250	40.	29.336	42.	39.8	34.0					36.1	35.4	34.0	33.0	0.05	N	4	N	2													sleet heavy at times fair P.m.	11					
12	29.250	40.	29.010	38.	35.7	33.0					36.8	35.0	36.0	35.0	0.15	N	6	N	6													sleet showers frequent.	12					
13	29.300	39.	29.340	43.	39.9	27.0					30.5	28.8	35.5	32.0	0.09	SW	1	S	2													fair clear & fine, rain P.m.	13					
14	29.400	41.	29.500	43.	40.4	27.4					33.6	32.8	30.5	29.0	0.00	SW	2	SW	1													fine fine frost P.m.	14					
15	29.450	41.	29.300	44.	39.0	29.8					38.0	36.5	36.0	34.5	0.18	S	2	S	6													dull fair. clearing.	15					
16	29.210	40.	29.300	43.	40.0	33.0					35.1	33.0	33.5	32.0	0.00	SW	1	SW	1													fair clear, fine all day	16					
17	29.500	41.	29.780	45.	44.0	30.0					32.8	30.6	34.5	33.0	0.00	SW	1	SW	1													Do Do	17					
18	29.900	41.	29.850	44.	42.0	28.0					31.0	29.3	33.5	31.0	0.03	SW	1	SW	1													Do Do	18					
19	29.700	43.	29.730	44.	41.5	29.5					40.0	37.8	38.2	37.5	0.00	SE	4	S	2													dull some rain	19					
20	29.900	43.	30.140	46.	42.0	34.0					35.8	32.4	33.6	32.0	0.00	N	2	N	1														fair & fine all day	20				
21	30.150	43.	30.165	46.	43.5	31.0					36.0	34.0	37.0	35.0	0.00	N	2	N	1													Do Do	21					
22	30.100	41.	29.750	44.	41.0	27.4					31.0	30.0	30.6	30.0	0.00	SW	1	N	1													Do Do	22					
23	29.780	41.	29.630	42.	39.0	28.0					32.2	30.2	30.0	28.0	0.00	N	1	N	1														Do Do	23				
24	29.560	40.	29.125	44.	44.0	26.8					28.0	26.8	33.0	34.0	0.34	N	1	S	4														Do dull P.m.	24				
25	28.725	43.	28.900	39.	43.0	34.0					38.0	36.8	37.5	35.0	0.00	SW	6	SW	6														stormy showers all day	25				
26	29.000	40.	29.125	46.	45.0	35.6					37.5	34.4	35.0	33.0	0.00	N	4	N	1														fair cold & fine	26				
27	29.260	43.	29.600	43.	45.0	29.0					35.8	34.3	36.3	35.0	0.03	N	2	N	2														dull fair some rain P.m.	27				
28	29.400	41.	29.400	43.	45.0	26.0					36.0	32.0	35.0	33.5	0.04	SW	4	N	4														dull fair sleet showers P.m.	28				
29																																					29	
30																																						30
31																																						31
Sums.	1392	6	1263	12	156	125					138	120	146	112	8																							
Means.	29.580	33	29.560	43.3	41.2	31.0					34.9	32.9	34.9	33.2																								
Corrections for Instrumental Errors.	-0.10		-0.10																																			
Corrections for Diurnal Range.																																						
Corrected Means	29.570		29.576																																			

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.537
Corrected Mean at 9 P.M., minus Correction for Temp. = 29.543
Mean at Station, corrected, and at 32°, = 29.540
Correction for height, feet above Mean Sea-level, = + 50
Mean, reduced to 32°, and Sea-level, = 29.590
Highest Reading, corrected for Index error, on the 7 th, = 30.300
Lowest Do. Do., on the 10 th, = 28.510
Difference, or Monthly Range, = 1.790

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 1 th, = 48.0
Lowest in Month, corrected for Index errors, on the 9 th, = 25.4
Difference, or Monthly Range, = 22.6
Mean of all the Highest, = 41.2
Mean of all the Lowest, = 31.0
Difference, or Mean Daily Range, = 10.2
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 36.1
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, = 34.9
Wet Bulb, Mean of A.M. and P.M. Readings, = 33.0
Computed Temperature of Dew-Point, = 29.9
Do. Elastic Force of Vapour, = 165
Do. Relative Humidity (Saturation = 100), = 81
RAIN fell on 17 Days; Amount in Inches, = 1.89

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0-12.
A.M.		1	-	-	2	1	10	4	10		3.0
P.M.		1				5	6	4	11		2.6
Sum.		2	0	0	2	6	16	8	21	0	2.8

Observations made and Return verified by Peter Housheer

(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.

FOUNTAIN 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 1/1000 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,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	Fruit Ripe 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,		
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.

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
.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. Cum. Str. S.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 sun or moon; of all Auroras, Meteors, or Halos round the 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 March 1906.Lat. 57° 9' N, Long. 2° 26' W, Distance from Sea 3 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.	9 A.M.		9 P.M.		Ane- moneter. 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 (0-10).		Species and Direction.	Amount (0-10).	No. 3 ins.	No. 12 ins.	No. 22 ins.			No. 36 ins.	No. 48 ins.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
inches.	°	inches.	°	°	°	°	°	°	°	inches.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1	29.476	42.	29.620	43.	36.2	30.2			34.8	32.6	34.0	32.0	0.05	NW	4	NW	2		Ci	8	Ci	5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

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.2	" heavy rain.		
sl.	" sleet.		
sn.	" snow.		
so. ha.	" solar halo.		
q.	" squall.		
q.2	" violent squalls.		
t.	" thunder.		
t. s.	" thunder-storm.		

BEAUFORT SCALE FOR ESTIMATING FORCE OF WIND—(0-12).

FORCE.	0	1	2	3	4	5	6	7	8	9	10	11	12
	Calm.	Light Air.	Light Breeze.	Gentle Breeze.	Moderate Breeze.	Fresh Breeze.	Strong Breeze.	Moderate Gale.	Fresh Gale.	Strong Gale.	Whole Gale.	Storm.	Hurricane.

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.513
Corrected Mean at 9 P.M., minus Correction for Temp. = 29.834
Mean at Station, corrected, and at 32° = 29.424
Correction for height, feet above Mean Sea-level, = + 50
Mean, reduced to 32°, and Sea-level, = 28.74
Highest Reading, corrected for Index error, on the 19th, = 30.400
Lowest Do. Do., on the 11th, = 28.775
Difference, or Monthly Range, = 1.625

S.R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 17th, = 57.0
Lowest in Month, corrected for Index errors, on the 14th, = 17.2
Difference, or Monthly Range, = 39.8
Mean of all the Highest, = 44.7
Mean of all the Lowest, = 32.4
Difference, or Mean Daily Range, = 12.3
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 38.6
S.R. THERMOMETER, Min. on Grass, Lowest in Month, = 17.2
" " Mean, = 38.6
Black Bulb, Max. in Sun, Highest in Month, = 57.0

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 39.1
Wet Bulb, Mean of A.M. and P.M. Readings, = 36.8
Computed Temperature of Dew-Point, = 33.8
Do. Elastic Force of Vapour, = .194
Do. Relative Humidity (Saturation = 100), = 82
RAIN fell on 19 Days; Amount in Inches, = 2.08

WIND.	SUMMARY.											
	Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0-12.	
A.M.		4	2	-	-	-	10	2	12	-	3.3	
P.M.		6	3	-	-	-	8	4	10	-	2.9	
Sum.		10	5	0	1	0	18	6	22	0	3.1	

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 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. Mercarial 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 apparent.	In Leaf.	Diversed of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appening above ground.	In Ear or Flower.	First Cut generally.	First Arrival.	Departure.
Alder,					Barley,						
Ash,					Ber 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,		
Mezevon,		Strawberry,		Rail or Corn Oake,		
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 Plumings, 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.

THE SECRETARY,

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.

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 providing 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, Cr. 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 Deeth's Park, Dundee, County of Aberdeen, During the MONTH of April 1906.

Lat. 56° 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.		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.	Min.			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.				
																															inches.	°
1	30.450	47.	30.550	45.	52.6	36.2			47.8	42.4	38.0	36.0	0.00	SW	2	SW	2		6									fair very fine all day	1			
2	30.560	45.	30.550	45.	52.0	28.2			48.2	44.2	41.5	38.0	0.00	S	2	SE	2		10									white frost-fair all day cool	2			
3	30.570	44.	30.300	49.	52.0	37.0			42.1	39.8	41.8	39.3	0.00	SW	2	S	4		2									fair fine all day -	3			
4	30.060	48.	29.900	48.	51.0	38.9			44.0	41.2	42.5	40.0	0.00	S	6	S	6		4		4							fair drying breeze cool	4			
5	29.800	45.	30.050	49.	51.0	39.8			43.0	40.0	45.0	43.0	0.00	S	2	SW	2		10		6							fair mild all day -	5			
6	30.350	44.	30.450	49.	56.1	34.2			44.8	40.2	42.0	39.0	0.00	SW	2	S	2		0		4							Do Do	6			
7	30.280	46.	30.325	57.	63.6	36.6			46.2	42.4	49.0	48.0	0.04	S	4	W	2		6		10							fair white frost Am, rain from 4 P.M.	7			
8	30.650	50.	30.725	49.	56.4	42.5			38.6	38.3	42.0	38.1	0.00	NW	2	S	2		5		0							fair mild all day	8			
9	30.700	48.	30.425	53.	63.0	34.0			47.0	44.0	48.0	42.0	0.00	SW	2	SW	2		0		2							white frost Am, fair fine all day	9			
10	30.500	48.	30.425	53.	63.6	34.2			49.0	44.0	50.5	47.0	0.00	SW	2	SW	2		0		3							Do Do Do Do	10			
11	30.400	48.	30.300	50.	59.0	33.4			47.0	44.1	42.0	40.0	0.00	SW	2	S	2		0		0							Do Do Do Do	11			
12	30.150	51.	30.050	54.	62.0	32.2			52.0	46.8	46.5	41.0	0.00	S	2	SW	2		0		6							Do Do Do Do	12			
13	29.925	53.	30.150	53.	65.8	38.0			38.6	51.0	47.0	45.0	0.12	S	2	N	4		2		10							fair cool, rain from 4 P.M.	13			
14	30.400	49.	30.350	50.	59.5	33.8			46.0	40.0	45.3	40.0	0.00	SW	2	W	4		2		6							some frost Am, fair all day	14			
15	30.250	48.	30.200	53.	62.0	40.2			49.6	44.2	51.0	47.5	0.22	SW	4	W	4		6		6							fair fine all day.	15			
16	30.100	49.	30.050	49.	42.0	40.8			42.0	41.0	42.2	39.0	0.35	NE	2	NE	2		10		10							mild rain from early morning 2 P.M.	16			
17	30.400	47.	29.765	47.	49.0	31.0			42.0	38.0	44.0	32.0	0.00	NW	2	SE	2		4		12							fair fine all day.	17			
18	30.000	47.	30.000	47.	44.8	29.0			40.5	37.8	38.5	36.0	0.00	N	2	N	2		4		0							fair white white frost Am, fair	18			
19	29.950	45.	29.810	46.	47.0	28.8			37.0	33.4	37.0	35.4	0.04	NE	2	S	4		8		5							white frost snowing Am from 12	19			
20	29.600	48.	29.560	50.	61.2	35.4			41.6	38.7	48.0	46.0	0.00	SW	4	SW	4		6		3							rain fresh all day	20			
21	29.440	50.	29.450	47.	53.2	37.8			52.0	46.4	40.4	37.2	0.00	SW	6	SW	2		3		3							fair morning stormy showers latter	21			
22	29.640	50.	29.900	46.	49.5	35.0			47.6	40.8	38.0	37.0	0.06	NW	6	NW	6		5		3							stormy showers	22			
23	30.015	46.	29.980	46.	49.0	33.5			36.8	34.0	38.5	36.0	0.08	NW	6	NW	4		5		2							Do Do Do Do frost P.M.	23			
24	29.965	44.	29.745	46.	45.2	31.0			40.0	36.8	38.0	35.0	0.00	NW	6	NE	2		3		6							frost Am, fair cold all day	24			
25	30.050	46.	29.720	44.	50.0	29.0			43.0	39.6	41.8	37.0	0.32	NW	4	SW	2		2		10							white frost-fair, clear P.M.	25			
26	29.600	46.	29.870	46.	48.0	33.2			41.8	39.4	40.5	38.0	0.00	NW	2	SW	2		10		8							ground covered snow Am fair all day	26			
27	29.650	48.	29.300	49.	51.0	38.0			45.4	42.5	43.8	42.0	0.25	S	2	NW	4		7		10							fair Am, rain from 1 P.M.	27			
28	29.175	45.	29.150	44.	49.4	36.0			43.0	36.8	36.0	33.4	0.00	N	4	S	2		2		2							slight sleet showers	28			
29	29.240	47.	29.500	48.	51.0	27.0			47.8	43.0	36.5	35.0	0.00	SE	2	SE	2		2		3							white frost Am, fair all day	29			
30	29.600	45.	29.660	47.	51.0	28.2			45.2	41.6	40.0	38.0	0.00	NE	2	NE	2		3		0							Do Do Do	30			
31																																
Sums.	13103	16	1493	16	135	167			154	1310	137	161	3						8		7										NOTATION USED IN GENERAL REMARKS.	
Means.	30.037	47.3	30.029	48.2	54.1	34.2			45.1	41.1	42.3	39.4			30		25		42		41											
Correc- tions for Instru- mental Errors.	-0.10		-0.10																													
Correc- tions for Diurnal Range.																																
Cor- rected Means	30.027		30.019																													

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.976
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.967
 Mean at Station, corrected, and at 32° = 29.972
 Correction for height, feet above Mean Sea-level, = + 0.50
 Mean, reduced to 32°, and Sea-level, = 30.022
 Highest Reading, corrected for Index error, on the 6 th, = 30.725
 Lowest Do. Do., on the 30 th, = 29.150
 Difference, or Monthly Range, = 1.575

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 13 th, = 65.8
 Lowest in Month, corrected for Index errors, on the 29 th, = 27.0
 Difference, or Monthly Range, = 38.8
 Mean of all the Highest, = 54.1
 Mean of all the Lowest, = 34.2
 Difference, or Mean Daily Range, = 19.9
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 44.2
 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, = 43.7
 Wet Bulb, Mean of A.M. and P.M. Readings, = 40.3
 Computed Temperature of Dew-Point, = 36.3
 Do. Elastic Force of Vapour, = 214
 Do. Relative Humidity (Saturation = 100), = 75
 RAIN fell on 9 Days; Amount in Inches, = 1.48

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0-12.
A.M.		1	3	-	1	7	10	1	7	-	3.0
P.M.		2	3	-	2	8	8	3	3	-	2.8
Sum.		3	6	0	4	15	18	4	10	0	2.9

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 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.	Dissected of Leaves.	CROPS mentioning variety.	Swing or Plucking.	Apparatus above Ground.	In Bar or Flower.	First Out or Harvest.
Alder,					Barley,				
Ash,					Bere or Biggs,				
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,		
Bourtree or Elder,		Black Currant,		Curtlew,		
Broom,		Cherry,		House-Swallow,		
Hazel,		Gum,		Lapwing,		
Hawthorn,		Gooseberry,		Plover,		
Holly,		Peach,		Sand-Martin,		
Laburnum,		Pear,		Starling,		
Lilac,		Plum,		Swan,		
Measeon,		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.

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 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 Zamboni'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 forest 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 force 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 on 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
.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 marked 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.

INSTRUCTIONS FOR TAKING METEOROLOGICAL OBSERVATIONS.

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; 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.

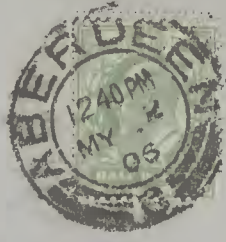
THE SECRETARY,

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 May 1906.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 2 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.		Aue. moneter. 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.			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	29.550	49.	30.538	48.	52.6	46.2	?			44.8	42.4	38.0	36.0	0.00	SW	2	SW	2	BL	6		0											Fair & very fine all day	1
2	30.560	45.	30.830	46.	52.0	38.2			44.2	41.5	38.0	36.0	0.00	S	2	S	2		0		hazy											White frost, fair all day cool	2	
3	29.525	51.	29.605	50.	58.0	43.0			54.0	50.6	45.0	43.0	0.00	S	4	SE	2		ci	4	ci	3										Do do all day	3	
4	29.650	50.	29.900	51.	59.0	42.4			49.2	46.8	44.0	41.8	0.00	S	2	NW	4		ci	6	ci	8										Do do Cold after noon	4	
5	30.030	49.	29.910	49.	53.0	32.0			50.0	45.0	45.0	44.0	0.18	S	4	S	4		ci	6	ci	10										Do rain from 2 P.M.	5	
6	29.725	53.	29.800	53.	53.4	43.8			49.2	48.0	52.0	50.6	0.00	SW	4	SW	4		ci	10	ci	4											Fair dull day all day	6
7	29.940	53.	30.075	55.	64.0	46.0			50.8	48.6	52.0	49.0	0.00	S	4	SW	2		ci	4	ci	4											Fair fine all day	7
8	30.100	57.	30.000	53.	62.2	50.0			60.1	53.0	47.0	45.6	0.47	SW	2	SE	2		ci	8	n	10											Fair fine beam from 2 P.M.	8
9	29.900	61.	29.900	52.	53.4	41.0			42.0	40.4	41.5	39.0	0.00	NW	4	N	2		ci	10	ci	2											Fair dull cold all day	9
10	29.810	61.	29.650	43.	48.4	33.2			43.0	42.0	40.2	38.0	0.04	N	2	SW	2		ci	8	ci	2											Fair cool some slight rain	10
11	29.630	47.	29.760	51.	50.0	38.0			48.8	45.0	45.4	44.0	0.11	SE	2	SE	2		ci	6	ci	10											Fair white frost slight rain later	11
12	29.900	49.	30.125	51.	55.6	45.0			47.2	46.6	47.0	45.5	0.00	SE	2	S	2		ci	10	ci	10											Dull most of the day	12
13	30.190	54.	30.345	57.	56.4	46.0			52.2	50.2	48.0	47.5	0.41	SW	2	S	4		ci	8	ci	8											Fair dull rain P.M.	13
14	30.150	52.	30.090	48.	56.2	46.0			46.5	44.0	40.2	38.0	0.02	NW	4	N	2		ci	8	-	0											Fair dull most of day	14
15	29.755	49.	29.530	51.	50.4	34.4			44.2	42.7	44.6	42.8	0.35	S	2	NW	2		ci	8	ci	10											Dull some rain heavy later	15
16	29.500	49.	29.530	46.	44.2	38.5			43.4	41.6	38.6	37.5	0.68	NW	4	NW	6		ci	10	ci	10											Dull frequent showers all day	16
17	29.400	47.	29.500	49.	46.5	37.0			44.0	42.0	43.4	42.5	0.15	NE	4	E	2		ci	10	ci	10											Dull frequent slight rain	17
18	29.750	48.	29.850	49.	47.5	37.0			46.0	45.0	44.4	43.0	0.18	E	2	N	4		ci	10	ci	10											Do do do	18
19	29.800	47.	29.925	48.	45.5	33.0			44.0	43.0	43.0	40.0	0.03	NE	4	N	4		ci	10	ci	10											Some rain fair after 3 P.M.	19
20	30.000	49.	30.055	49.	47.5	40.6			46.5	42.0	44.0	41.5	0.00	NE	4	NE	4		ci	7	ci	8											Fair cool all day	20
21	30.000	46.	30.000	48.	46.5	37.0			43.4	40.1	40.0	38.0	0.00	NW	2	NE	1		ci	8	ci	8											Some slight rain	21
22	30.000	48.	30.050	48.	52.0	33.8			43.0	40.0	41.5	39.0	0.02	N	2	E	1		ci	8	ci	6											Cool fair all day	22
23	30.000	49.	30.040	49.	51.4	39.5			45.1	42.0	45.0	42.4	0.16	SE	2	E	4		ci	8	ci	10											Some slight rain Cool, rain P.M.	23
24	30.000	49.	29.900	50.	48.0	42.8			45.0	44.0	46.0	45.0	0.68	E	2	E	2		ci	10	ci	10											Rain heavy after noon	24
25	29.800	48.	29.850	50.	49.6	44.4			47.8	47.4	43.5	42.0	0.00	0	0	0	0		ci	0	ci	10											Thunder 3 A.M. heavy rain P.M. fair	25
26	29.850	52.	29.845	50.	59.0	43.6			43.0	42.0	43.8	46.0	0.06	SW	1	S	1		ci	8	ci	10											Dull somewhat fair after	26
27	29.800	52.	29.875	50.	59.0	44.4			48.2	47.2	47.5	46.0	0.02	SW	2	E	1		ci	10	ci	10											Dull some rain, mild later	27
28	29.850	53.	29.900	52.	64.0	44.5			57.0	48.0	49.0	48.0	0.08	NE	1	SW	2		ci	10	ci	8											Dull fair all day	28
29	29.810	58.	29.810	56.	64.2	48.4			59.0	57.6	54.0	51.5	0.04	SW	2	SW	1		ci	8	ci	4											Some rain frequent, fair P.M.	29
30	29.500	54.	29.750	58.	53.2	47.0			57.8	50.0	49.8	48.0	0.10	SE	1	S	1		ci	10	ci	10											Dull fog most of day	30
31	29.525	56.	29.500	54.	60.5	48.0			57.6	52.2	44.0	43.0	0.24	SW	1	0	0		ci	8	ci	5											Fair thunder heavy rain	31
Sums.	1672	18	1694	13	138	103			158	116	156	156	39																					
Means.	29.817	50.6	29.838	50.2	54.1	39.6			48.1	45.7	44.8	43.0	4.02																					
Corrections for Instrumental Errors.	-0.10		-0.10																															
Corrections for Diurnal Range.																																		
Corrected Means	29.807		29.828																															

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.748
Corrected Mean at 9 P.M., minus Correction for Temp. = 29.770
Mean at Station, corrected, and at 32° = 29.759
Correction for height, feet above Mean Sea-level, = + .49
Mean, reduced to 32°, and Sea-level, = 29.808
Highest Reading, corrected for Index error, on the 13 th, = 30.190
Lowest Do. Do., on the 17 th, = 29.400
Difference, or Monthly Range, = .790

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 29 th, = 64.2
Lowest in Month, corrected for Index errors, on the 2 th, = 28.2
Difference, or Monthly Range, = 36.0
Mean of all the Highest, = 54.1
Mean of all the Lowest, = 39.6
Difference, or Mean Daily Range, = 14.5
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 46.8
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, = 46.5
Wet Bulb, Mean of A.M. and P.M. Readings, = 44.4
Computed Temperature of Dew-Point, = 41.7
Do. Elastic Force of Vapour, = 264
Do. Relative Humidity (Saturation = 100), = 83
RAIN fell on 20 Days; Amount in Inches, = 4.02

WIND.		SUMMARY.							
Direction.		N	NE	E	SE	S	SW	W	NW
A.M.		1	4	2	3	6	9	1	4
P.M.		3	2	3	3	6	6	1	3
Sum.		4	6	7	6	12	15	2	7

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.

FOURTH 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 Harvest.
Alder.					Barley.				
Ash.					Bero or Bigg.				
Beech.					Oats.				
Birch.					Wheat.				
Elm.					Beans.				
Larch.					Pease.				
Lime.					Potatoes.				
Oak.					Turnips.				
Sycamore or Plane.					Rye Grass.				

SERIES, 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.		
Mezereon.		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.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a covered 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 attached 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 thirty-fifth 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 Fleming's, 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 changed 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, Cr. 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 sun or moon; of all Auroras, Meteors, or Halos round the 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 Aberdeen, County of Aberdeen, During the MONTH of July 1906.

Lat. 57° 10', Long. 2° 10' 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

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.		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.	Direction.	Force, Scale of 0-12.	Direction.	Force, Scale of 0-12.	Amount 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	30.240	56.	30.250	54.	57.0	47.0			49.0	44.0	43.	45.	0.00	NW	4	NW	2		ci	6	ci	5							fair dull all day	1	
2	30.200	59.	30.240	54.	65.0	45.0			59.0	55.0	53.	52.	0.00	S	2	SE	2			5		8							fair and fine do	2	
3	30.200	60.	30.240	58.	66.0	49.0			60.0	54.0	61.	59.	0.20	SE	2	SW	2			5		8							do do	3	
4	30.250	54.	30.240	58.	63.0	50.0			54.0	52.0	54.	52.	0.01	NW	2	E	2			10		8							fair dull	4	
5	30.160	57.	30.250	59.	61.0	48.0			57.0	55.0	56.	53.	0.00	E	1	SE	3			6		6							fair fine	5	
6	30.010	62.	30.020	60.	70.0	42.0			62.0	58.0	61.	59.	0.00	SE	1	S	2		fog	10		10							fair fine all day	6	
7	29.000	60.	29.050	61.	71.2	52.0			61.4	58.5	61.4	52.6	0.00	SW	2	SW	2			5		5							do do	7	
8	30.150	69.	30.300	60.	72.2	52.7			64.8	54.2	65.5	57.5	0.00	SW	2	SW	2			0		6							fair & very fine all day	8	
9	30.210	62.	30.190	59.	71.8	43.4			62.0	55.6	56.2	52.0	0.00	S	2	S	1			ci	4	ci	8						do do	9	
10	30.140	60.	30.210	59.	69.2	54.0			57.6	52.0	54.5	52.0	0.00	NW	1	NW	1			ci	8	ci	6						fair fine, shower afternoon	10	
11	30.230	58.	30.230	57.	61.5	43.0			61.5	45.0	56.4	50.0	0.36	NW	1	NW	1			ci	4	ci	8						fair fine, heavy from 1 P.M.	11	
12	30.275	56.	30.150	58.	63.0	48.0			53.6	50.0	50.2	49.8	0.00	NW	2	SE	1			ci	8	ci	5						dull fair all day	12	
13	30.000	58.	29.950	57.	68.0	47.5			58.8	56.0	57.6	56.5	0.03	NW	2	NW	2			ci	8	ci	10						dull fair light rain from 6 P.M.	13	
14	29.875	56.	29.780	59.	69.0	51.0			53.8	52.6	54.5	57.0	0.13	S	2	W	2			ci	10	ci	6						do do some rain P.M.	14	
15	29.780	57.	29.800	58.	64.6	53.0			57.7	52.8	53.0	47.0	0.00	W	4	W	4			ci	5	ci	4						fair fine Windy Showers P.M.	15	
16	29.755	57.	29.700	59.	67.0	47.0			54.4	50.0	52.5	50.0	0.11	SW	2	SW	1			ci	8	ci	8						fair dull some rain P.M.	16	
17	29.850	52.	29.700	60.	65.5	46.6			54.6	52.4	52.0	53.4	0.03	SW	4	SW	4			ci	10	ci	6						fair, rain 9 A.M. clearing fair	17	
18	29.650	62.	29.455	61.	65.0	59.0			62.2	58.5	59.8	57.0	0.00	SW	6	SW	4			ci	6	ci	6						fair & breezy all day	18	
19	29.500	60.	29.655	61.	64.2	49.8			56.8	49.8	54.0	45.0	0.00	W	6	SW	4			ci	6	ci	4						do do	19	
20	29.545	57.	29.650	56.	61.6	45.4			53.0	47.7	49.0	45.2	0.00	W	8	W	4			ci	8	ci	6						do do do	20	
21	29.850	59.	29.920	56.	66.0	46.0			56.0	47.5	53.0	50.2	0.01	S	6	SE	1			ci	6	ci	8						do do do	21	
22	29.800	62.	29.850	58.	74.1	52.0			65.0	62.0	55.0	53.8	0.05	S	2	SW	1			ci	6	ci	6						slight rain, sun then fair showers	22	
23	29.910	58.	29.810	57.	64.2	50.0			57.0	53.8	53.0	53.0	0.00	SE	2	NW	2			ci	8	ci	6						fog frequent fair after 10 A.M.	23	
24	29.800	61.	30.000	59.	67.0	45.0			60.0	53.4	53.8	47.0	0.00	SW	2	W	2			ci	2	ci	3						fair clear & fine all day	24	
25	30.140	60.	30.150	57.	68.0	41.0			58.0	52.0	53.4	57.2	0.00	SW	4	S	2			ci	2		0						do do do	25	
26	30.110	59.	30.020	59.	65.4	50.8			58.6	55.4	55.0	53.4	0.00	SE	4	SE	4			ci	2	ci	10						do do do	26	
27	29.960	60.	29.960	59.	69.2	53.6			58.0	56.0	56.4	54.0	0.00	SE	2	SE	1			ci	10		10						dull fair, clearing, fog P.M.	27	
28	29.980	59.	29.950	59.	61.0	54.6			57.0	53.4	57.0	56.0	0.01	SE	4	SW	2			ci	10	ci	6						do some slight rain P.M.	28	
29	29.950	61.	30.060	61.	67.0	49.0			60.1	57.0	52.0	50.0	0.00	SE	1	S	1			ci	8		0						fair and fine all day	29	
30	30.075	58.	30.070	58.	64.5	48.0			57.9	56.4	56.0	55.0	0.00	S	1	SE	1			ci	10	ci	10						do do fog.	30	
31	29.950	58.	29.900	58.	61.1	53.8			59.0	58.4	56.0	54.0	1.16	SE	1	S	1			ci	10	ci	10						Constant Thunder from 10 A.M. to 6 P.M. (severe)	31	
Sums.	1492	14	1321	15	145	146			168	159	146	134	13							106		14									
Means.	29.984	59.0	29.981	58.6	65.8	49.0			58.1	53.7	55.5	52.4	2.7		2.1					6.0		6.5									
Corrections for Instrumental Errors.	-0.10		-0.10																												
Corrections for Diurnal Range.	-0.040																														
Corrected Means	29.974		29.971																												

NOTATION USED IN GENERAL REMARKS.									
a.	drizzle 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.	" snow.								
su.	" sleet.								
so. ha.	" solar halo.								
q.	" squall.								
q.s.	" violent squalls.								
t.	" thunder.								
t. s.	" thunder-storm.								
CLOUDS.									
HIGH CLOUDS.									
Cirrus.	"	"	"	"	"	"	"	"	"
Cirro-stratus.	"	"	"	"	"	"	"	"	"
Cirro-cumulus.	"	"	"	"	"	"	"	"	"
MIDDLE CLOUDS.									
Strato-cirrus.	"	"	"	"	"	"	"	"	"
Cumulo-cirrus.	"	"	"	"	"	"	"	"	"
LOWER CLOUDS.									
Strato-cumulus.	"	"	"	"	"	"	"	"	"
Cumulus.	"	"	"	"	"	"	"	"	"
Cumulo-nimbus.	"	"	"	"	"	"	"	"	"
Nimbus.	"	"	"	"	"	"	"	"	"
Stratus.	"	"	"	"	"	"	"	"	"

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

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.892
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.891
 Mean at Station, corrected, and at 32° = 29.862
 Correction for height, feet above Mean Sea-level, = + 48
 Mean, reduced to 32°, and Sea-level, = 29.910
 Highest Reading, corrected for Index error, on the 12th, = 30.275
 Lowest Do. Do., on the 18th, = 29.455
 Difference, or Monthly Range, = 0.820

S-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 22th, = 74.1
 Lowest in Month, corrected for Index errors, on the 25th, = 41.0
 Difference, or Monthly Range, = 33.1
 Mean of all the Highest, = 65.8
 Mean of all the Lowest, = 49.0
 Difference, or Mean Daily Range, = 16.8
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 57.4
 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, = 56.8
 Wet Bulb, Mean of A.M. and P.M. Readings, = 53.0
 Computed Temperature of Dew-Point, = 49.5
 Do. Elastic Force of Vapour, = 35.4
 Do. Relative Humidity (Saturation = 100), = 76
 Rain fell on 11 Days; Amount in Inches, = 2.10

WIND.		SUMMARY.									
Direction.		N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0-12.
A.M.		-	1	1	8	6	7	3	5	-	2.7
P.M.		-	1	-	6	7	9	4	4	-	2.1
Sum.		0	2	1	14	13	16	7	9	0	2.4

This is not quite complete the first 6 days, being across to Skelana on holiday and substitute not quite up to all particulars P.H.

Observations made and Return verified by Peter Haaper
 (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. Mercantile 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 Out or Harvested.
Alder,					Barley,				
Ash,					Bere or Pigg,				
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,		
Boutree or Elder,		Black Currant,		Curdew,		
Broom,		Cherry,		House-Swallow,		
Hazel,		Gean,		Lapwing,		
Hawthorn,		Gooseberry,		Plover,		
Holly,		Peach,		Sand-Martin,		
Laburnum,		Pear,		Starling,		
Lilac,		Plum,		Swan,		
Mezreon,		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.

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.

ADDITIONAL REMARKS.

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 sun or moon; of all Auroras, Meteors, or Halos round the 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.

Warden July 06

THE SECRETARY,

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Ruthie Park, Aberdeen, County of Aberdeen, During the MONTH of August 1906.

Lat. 57.9, Long. W 2.6, 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

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.	Direction.	Force. Scale of 0-12.	Direction.	Force. Scale of 0-12.	Aue. nometeter. 9 A.M.	9 A.M.		9 P.M.			Amount (0-10).	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 (0-10).	Species and Direction.	Amount (0-10).			No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
																																				inches.	°	inches.	°	°	°	°	°	inches.	°	°	°	°	°	°	°	°	°	°	°	°																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
1	30.050	61.	30.000	58.	68.0	48.0			60.8	59.8	57.0	55.0	0.00	S	2	S	1		Ci	2	Ci	6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.818
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.834
 Mean at Station, corrected, and at 32° = 29.826
 Correction for height, feet above Mean Sea-level, = + 48
 Mean, reduced to 32°, and Sea-level, = 29.864
 Highest Reading, corrected for Index error, on the 27th, = 30.390
 Lowest Do. Do., on the 13th, = 29.465
 Difference, or Monthly Range, = .925

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 31st, = 79.5
 Lowest in Month, corrected for Index errors, on the 19th, = 41.0
 Difference, or Monthly Range, = 38.5
 Mean of all the Highest, = 65.4
 Mean of all the Lowest, = 49.9
 Difference, or Mean Daily Range, = 15.5
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 57.6
 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, = 56.6
 Wet Bulb, Mean of A.M. and P.M. Readings, = 54.2
 Computed Temperature of Dew-Point, = 50.0
 Do. Elastic Force of Vapour, = 3.80
 Do. Relative Humidity (Saturation = 100), = 84
 RAIN fell on 15 Days; Amount in Inches, = 3.29

WIND.	SUMMARY.									
	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0-12.
A.M.	0	1	2	3	4	12	2	3	0	
P.M.	0	1	2	3	5	8	4	5	3	
Sum.	0	2	4	6	9	20	6	12	3	1.9

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.

FORIN 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.	Appearance above Ground.	In Ear or Flower.	First Cut or Harvest.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Larch,					Beans,				
Lime,					Pease,				
Oak,					Potatoes,				
Sycamore or Plane,					Turnips,				
					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom, generally.	Fruit Ripe.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bouthead or Elder,		Black Currant,			Culw,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezereon,		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 is .06, if up to the twenty-third line is .23, if up to the thirtieth line is .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 noted 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 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.

THE SECRETARY,

Scottish Meteorological Society,

122 George Street,

EDINBURGH.

BOOK POST.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Ruthie Park, Dundee, County of Dundee, During the MONTH of September 1906.
 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. <i>Mention the hour at which Storms, including Thunder and Lightning, began and ended.</i>	Days of Month.							
	9 A.M.		9 P.M.		Projected 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.		Amount (0-10).	Species and Direction.	Amount (0-10).		Species and Direction.	Amount (0-10).	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.							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	30.050	63.	30.050	66.	79.2	53.0					66.5	62.0	63.0	60.0	0.00	SW	1	SW	1		0	ci	2								fair & very fine all day.	1				
2	29.975	64.	29.975	64.	79.0	55.5					65.0	60.0	61.0	57.0	0.00	S	2	S	0		0		0								do do do	2				
3	30.045	65.	30.150	63.	73.0	54.8					66.5	62.0	57.5	57.0	0.00	SE	1	N	2		ci	4	ci	10								do do dull after noon	3			
4	30.200	62.	30.160	60.	63.4	55.5					57.0	54.0	62.0	60.0	0.00	W	2	S	2		ci	6	ci	5								fair fine & dull fine all day	4			
5	29.950	59.	29.475	63.	60.4	47.6					57.0	55.0	60.0	56.4	0.17	SW	4	SW	6		ci	8	ci	8								fair high wind, fair	5			
6	29.700	60.	29.850	58.	65.0	49.9					58.0	51.4	53.0	49.0	0.03	W	4	W	2		ci	4	ci	13								fair unsettled & fine all day	6			
7	29.850	63.	29.910	65.	75.2	50.0					63.8	61.4	62.0	57.0	0.03	SW	4	SW	2		ci	4	ci	8								fair & fine some slight rain	7			
8	29.910	62.	30.025	61.	64.2	48.6					56.6	52.0	54.0	48.5	0.02	W	2	W	2		ci	3	ci	2								do do do	8			
9	30.100	58.	30.240	57.	65.4	52.4					55.0	47.5	50.0	47.0	0.02	W	4	W	4		ci	6		0								fair some slight rain	9			
10	30.350	56.	30.400	58.	61.0	46.5					53.2	50.0	51.0	49.0	0.00	NW	4	SE	2		ci	2		0								fair fine all day	10			
11	30.275	57.	30.150	61.	60.4	43.0					53.0	49.7	52.0	54.4	0.00	S	4	S	2		SE	3	ci	2								do do	11			
12	30.100	57.	30.075	58.	60.1	32.0					56.2	55.0	52.5	51.0	0.06	SW	2	SW	1		ci	8		0								dull some rain	12			
13	29.900	58.	29.725	59.	59.2	51.0					56.6	55.0	53.0	51.0	0.27	S	4	NE	1		ci	8	W	10								dull fair, rain from 2 P.M.	13			
14	29.600	56.	29.540	56.	53.8	43.2					52.0	50.0	47.4	46.0	0.25	SW	2	SW	1		ci	5		0								fair & fine slight showers mild	14			
15	29.365	56.	29.570	57.	59.2	42.0					52.2	51.0	48.4	46.0	0.00	SW	2	SW	2		ci	5		0								unsettled, fair & fine	15			
16	29.800	62.	30.150	56.	60.0	42.0					54.4	51.8	58.5	55.5	0.01	NW	2	NW	1		ci	6		0								fair some slight rain fair P.M.	16			
17	30.205	63.	31.150	50.	61.4	40.0					49.0	47.6	49.4	48.4	0.00	SW	2	SW	2		ci	6		0								fair mild all day	17			
18	30.500	57.	30.490	58.	61.0	40.0					49.0	47.6	55.0	53.2	0.00	SW	2	S	1		ci	2	ci	1								fair & fine all day	18			
19	30.400	67.	30.400	59.	58.0	48.0					54.8	53.5	53.0	51.0	0.00	S	2	S	1		ci	6	ci	8								do do	19			
20	30.400	56.	30.450	58.	58.4	47.4					49.4	48.0	53.0	51.4	0.00	S	2	S	1		ci	5	ci	8								do do	20			
21	30.500	57.	30.500	59.	60.0	47.0					52.2	51.6	47.5	46.0	0.00	SE	1	SW	1		ci	5		0								do do	21			
22	30.501	56.	30.600	58.	57.2	40.5					52.0	51.0	45.8	43.0	0.00	S	1	SW	1		ci	5		0								fair dull clearing from noon	22			
23	30.610	54.	30.650	52.	57.4	35.0					46.0	45.0	40.0	38.2	0.00	S	2	SE	1					0								fair & very fine	23			
24	30.580	51.	30.580	57.	57.8	33.0					43.5	42.5	46.0	45.0	0.00	SW	6	SW	2		ci	2		0								fair white frost, windy at noon	24			
25	30.500	57.	30.425	61.	60.0	33.0					46.2	45.1	48.4	46.8	0.00	SW	1	SW	1		ci	5		0								fair mild and fine all day	25			
26	30.590	57.	30.670	58.	60.5	41.4					45.0	45.0	45.0	43.4	0.00	SW	2	SW	1		ci	4		0								do do do	26			
27	30.550	58.	30.500	54.	61.2	34.4					39.0	38.0	45.0	43.2	0.00	SW	2	SW	1		ci	2	ci	2									do do do	27		
28	30.500	53.	30.425	57.	60.0	37.6					49.0	47.0	45.5	44.0	0.00	SW	2	SW	1					0								do do	28			
29	30.375	53.	30.355	56.	63.0	40.8					50.0	47.6	43.6	42.0	0.00	SW	2	SW	1		ci	4		0								do do	29			
30	30.240	52.	30.160	53.	57.0	36.0					44.0	42.8	49.0	48.2	0.00	SW	1	S	0		ci	3		10								fair do thick fog from 5 P.M.	30			
31																																				31
Sums.	1483	12	1214	11	36	128					166	127	136	153	0.86							11		4												
Means.	30.190	56.9	30.198	57.5	63.0	44.9					53.3	50.8	52.0	49.7							7.2		4.6													
Correc- tions for Instru- mental Errors.	-0.20		-0.20								-3		-3																							
Correc- tions for Diurnal Range.																																				
Cor- rected Means	30.170		30.178								53.0	50.8	51.7	49.7																						

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

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

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.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.
Cirrostratus.		cir-str.
Cirrocumulus.		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.
1 Light Air.	6 Strong Breeze.	10 Whole Gale.
2 Light Breeze.	7 Moderate Gale.	11 Storm.
3 Gentle Breeze.	8 Fresh Gale.	12 Hurricane.

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 30.094
 Errors, on the 1st th,
 Corrected Mean at 9 P.M., minus Correction for Temp. = 30.097
 Errors, on the 1st th,
 Mean at Station, corrected, and at 32°, = 30.096
 Correction for height, feet above Mean Sea-Level, = + 49
 Mean, reduced to 32°, and Sea-level, = 30.145
 Highest Reading, corrected for Index error, on the 23rd th, = 30.650
 Lowest Do. Do., on the 16th th, = 29.365
 Difference, or Monthly Range, = 1.285

S-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 1st th, = 79.2
 Lowest in Month, corrected for Index errors, on the 24th th, = 33.0
 Difference, or Monthly Range, = 46.2
 Mean of all the Highest, = 63.0
 Mean of all the Lowest, = 44.9
 Difference, or Mean Daily Range, = 18.1
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = +0.8
 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, = 52.4
 Wet Bulb, Mean of A.M. and P.M. Readings, = 50.2
 Computed Temperature of Dew-Point, = 48.0
 Do. Elastic Force of Vapour, = 33.5
 Do. Relative Humidity (Saturation = 100), = 85
 RAIN fell on 9 Days; Amount in Inches, = 0.86

WIND. SUMMARY.

Direction.	N	NE	E	SE	S	SW	W	NW	Caln or Variable.	Mean Force 0-12.
A.M.	-	-	2	2	3	15	4	2	-	2.4
P.M.	1	1	3	2	3	15	3	1	1	1.5
Sum.	1	1	5	4	6	30	7	3	1	2.0

Observations made and Return verified by Peter H. 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 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.

FOUNT 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.	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,				
Larch,					Beans,				
Elm,					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,		
Mezereon,		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 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 is .06, if up to the twenty-third line is .23, if up to the thirtieth line is .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.

The direction and force of the Wind should be noted at 9 A.M. and 9 P.M. In confined situations the direction cannot be easily observed, it is ascertained by this by watching the movement of smoke from a chimney, or even of the lower clouds. The force of the wind should be noted according to the scale given on the back 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 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 Dunfermline, County of Fife, During the MONTH of October 1906.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.		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.		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.	No.	No.	Dry bulb. No.	Wet bulb. No.	Dry bulb. No.	Wet bulb. No.	Direction.	Force. Scale of 0-12.		Direction.	Force. Scale of 0-12.	Species and Direction.	Amount (0-10).		Species and Direction.	Amount (0-10).	Hours.	No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.					
																													inches.	°	inches.	°	
1	30.025	48	29.800	58	57.0	41.5			44.5	43.6	52.5	57.0	0.00	SW	1	SW	1	fog	15	haze	10	-							f	fair fog most of the day	1		
2	29.650	55	29.650	57	56.8	49.0			52.0	49.5	55.8	44.0	0.00	W	2	W	3	st.	8	ci	8	-								fair fine breeze & cold	2		
3	29.825	56	30.010	58	56.0	50.6			53.6	52.6	55.0	53.0	0.09	N	1	N	6	ci	8	m	10	-								fair dull some rain 2 P.M. then fair	3		
4	30.000	56	29.850	58	60.4	48.4			52.0	51.0	57.0	56.0	0.31	S	2	SE	1	ci	8	m	10	-								fair dull damp wind rain from 1 P.M.	4		
5	29.600	58	29.910	59	64.0	51.0			61.6	58.0	56.5	55.5	0.13	SW	2	SW	2	ci	6	ci	8	-								fair mild fair, fresh S.W.	5		
6	29.810	56	29.850	60	62.6	48.4			52.0	50.8	53.0	51.0	0.00	SW	1	SW	1	ci	2	ci	2	-								fair fine all day	6		
7	29.850	59	29.810	59	60.2	42.0			58.0	56.4	55.0	53.0	0.07	S	4	SW	2	ci	4	ci	8	-								fine breeze, some rain from 2 P.M.	7		
8	29.720	57	29.760	60	60.0	45.4			52.0	51.0	53.5	51.5	0.03	SW	4	SE	4	ci	2	ci	0	-								fair dry ing wind from 10 A.M.	8		
9	29.910	58	30.050	59	58.0	45.3			54.4	53.3	54.0	52.0	0.04	SE	2	SE	2	ci	8	ci	10	-								dull some rain	9		
10	30.000	57	30.000	59	56.6	53.2			56.0	55.0	53.4	51.0	0.02	SE	2	SE	1	fog	10	fog	10	-								some rain dull,	10		
11	29.850	56	29.750	59	54.4	54.6			54.7	54.5	54.5	54.0	0.92	SE	1	SE	1	fog	10	fog	10	-								slight rain dull	11		
12	29.600	58	29.600	58	53.0	47.0			49.8	47.5	48.0	44.0	0.00	NW	2	NW	2	ci	8	ci	0	-								clear fine all day	12		
13	29.575	53	29.800	46	53.0	39.0			43.2	41.0	43.0	42.0	0.23	NW	4	NW	4	ci	8	ci	6	-								dull some but showers	13		
14	29.575	49	29.560	51	48.0	33.0			40.4	37.5	40.0	38.6	0.01	S	6	S	2	ci	8	ci	0	-								fair dull some slight rain	14		
15	29.400	52	29.400	52	56.4	39.0			41.0	38.8	41.5	40.0	0.00	SW	2	SW	1	ci	6	ci	0	-								fair fine all day	15		
16	29.405	52	29.425	52	46.0	38.0			45.0	42.0	44.1	42.0	0.00	SW	4	SW	2	ci	4	ci	0	-								do do	16		
17	29.450	50	29.575	52	49.4	37.9			46.4	42.0	44.0	42.0	0.00	SW	6	SW	4	ci	3	ci	0	-								do do	17		
18	29.950	45	29.870	50	46.0	33.6			42.0	40.0	40.0	39.0	0.50	W	2	N	2	ci	8	ci	8	-								fair dull some rain from 2 P.M.	18		
19	29.650	48	29.810	49	48.8	37.0			38.0	37.5	39.0	38.5	0.82	N	8	N	6	ci	10	ci	10	-								very wet and bad fair S.W.	19		
20	29.600	49	29.850	49	51.0	37.6			47.0	45.4	45.4	44.0	0.05	N	4	N	2	ci	8	ci	0	-								frequent showers, fair after	20		
21	29.925	50	29.925	52	54.8	35.1			44.8	44.4	46.5	46.0	0.07	N	2	N	2	ci	15	ci	10	-								dull fog most of day	21		
22	29.740	54	29.625	55	53.4	49.0			54.5	54.0	53.5	53.0	0.39	S	4	SE	4	m	10	ci	0	-								dull damp frequent rain	22		
23	29.800	53	29.840	57	53.2	48.0			53.0	51.5	46.8	45.0	0.00	S	4	S	4	ci	10	ci	6	-								fair fine all day	23		
24	30.000	51	30.125	53	52.0	44.0			45.0	43.8	39.5	39.0	0.00	SW	1	SW	1	ci	5	ci	0	-								do do	24		
25	30.320	49	30.300	42	50.2	31.0			33.5	33.0	30.5	38.0	0.00	SW	1	SW	2	ci	8	ci	6	-								occasional frost fair after	25		
26	29.980	52	29.800	51	52.0	33.5			50.0	46.6	39.4	39.0	0.58	S	8	S	4	ci	8	m	10	-								dull heavy rain from 1 P.M.	26		
27	29.900	46	29.675	53	49.4	33.0			38.0	37.0	49.2	47.0	0.00	NW	2	S	2	ci	2	ci	8	-								rain fine dull	27		
28	29.380	53	29.200	53	57.8	42.0			48.0	46.5	44.0	42.0	0.06	SW	2	SW	2	ci	8	ci	5	-								will like rain clear after	28		
29	29.175	46	29.245	40	45.0	29.5			33.0	32.2	34.5	33.0	0.00	SW	1	N	6	ci	5	ci	0	-								white frost fair fine	29		
30	29.410	44	29.500	48	51.8	28.6			27.8	29.0	40.5	39.0	0.79	SW	1	N	6	ci	0	N	10	-								do do heavy rain from 5 P.M.	30		
31	29.740	51	29.815	53	51.7	38.0			57.5	56.8	42.0	41.0	0.04	SE	4	SE	2	m	10	N	10	-								dull fair all day	31		
Sums.	1693	16	1794	15	139	177			137	130	143	142	5.9																				
Means.	29.747	52.3	29.738	54.3	53.9	41.7			47.3	45.7	46.9	45.5			2.9		2.3																
Corrections for Instrumental Errors.	-0.20		-0.20																														
Corrections for Personal Range.																																	
Corrected Means	29.727		29.718																														

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.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.	0	1	2	3	4	5	6	7	8	9	10	11	12
Calms.													
Light Air.													
Light Breeze.													
Gentle Breeze.													
Moderate Breeze.													
Fresh Breeze.													
Strong Breeze.													
Whole Gale.													
Moderate Gale.													
Fresh Gale.													
Storm.													
Hurricane.													

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.663
Corrected Mean at 9 P.M., minus Correction for Temp. = 29.649
Mean at Station, corrected, and at 32', = 29.656
Correction for height, feet above Mean Sea-level, = + 44
Mean, reduced to 32', and Sea-level, = 29.703
Highest Reading, corrected for Index error, on the 30 th, = 30.320
Lowest Do. Do., on the 29 th, = 29.175
Difference, or Monthly Range, = 1.145

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 31 th, = 64.0
Lowest in Month, corrected for Index errors, on the 30 th, = 28.6
Difference, or Monthly Range, = 35.4
Mean of all the Highest, = 53.9
Mean of all the Lowest, = 41.7
Difference, or Mean Daily Range, = 12.2
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 70.6
S.-R. THERMOMETER, Min. on Grass, Lowest in Month, = 47.8
" " Mean, = 53.9
Black Bulb, Max. in Sun, Highest in Month, = 57.5

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, = 47.1
Wet Bulb, Mean of A.M. and P.M. Readings, = 45.6
Computed Temperature of Dew-Point, = 44.0
Do. Elastic Force of Vapour, = 288
Do. Relative Humidity (Saturation = 100), = 89
RAIN fell on 19 Days; Amount in Inches, = 5.24

WIND.		SUMMARY.									
Direction.	N	NE	E	SE	S	SW	W	NW	Calms or Variable.	Mean Force 0-12.	
A.M.	1	2	-	4	6	12	2	4	-	29	
P.M.	-	6	-	7	4	10	-	4	-	23	
Sum.	1	8	0	11	10	22	2	8	0	26	

Observations made and Return verified by John D. 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 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.

FORIN 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 Forin 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 TRAPEZOIDAL 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. 29.365, 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.	In Leaf first Appear.	Dyed of Leaves.	FRUIT.	First in Blossom.	First in Blossom generally.	FRUIT Ripe.	First in Blossom.	First Arrival.	Departure.
Alder,										
Ash,										
Beech,										
Birch,										
Elm,										
Larch,										
Lime,										
Oak,										
Sycamore or Plane,										

SHRUBS, ETC.	First in Blossom.	FRUIT.	First in Blossom.	FRUIT Ripe.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Bountree or Elder,		Black Currant,			Culwre,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mazeron,		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.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a towered 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 Zamboni'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 force 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 on a stand or two below the level of the bulbs and at the side of the Wet Bulb further 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
.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 13 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 for the values being entered to the previous day, as MAX. 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; 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 November 1906.

Lat. 57.9 N, Long. 2.6 W, Distance from Sea 3 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.				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.	Direction.	9 A.M.		Force, Scale of 0-12.	Direction.	9 A.M.		Species and Direction.	Amount (0-10).	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.			Species and Direction.	Amount (0-10).			No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.						
																														inches.	°	inches.	°
1	29.750	50	29.450	54	51.0	47.2			48.0	47.0	48.5	48.0	0.44	CB	4	CB	4		4	10	4	10								Wet dull all day	1		
2	29.350	52	29.870	53	50.5	43.0			50.0	49.4	48.0	47.0	0.37	CB	6	CB	6		4	10	4	10								very wet all day	2		
3	29.400	52	29.590	54	50.8	46.0			48.4	46.5	47.5	46.0	0.04	S	4	SE	4		4	3	4	8								rain most of the day	3		
4	29.660	54	29.600	54	51.4	47.0			50.8	48.6	48.0	47.5	0.19	CB	4	SE	4		4	8	4	10								fair, frequent rain heavy P.M.	4		
5	29.505	50	29.615	55	48.6	45.0			45.1	44.5	43.0	42.5	0.45	N	2	N	2		4	10	4	10								wet more or less all day	5		
6	29.750	50	29.800	53	49.0	39.0			41.2	40.6	43.5	42.0	0.00	SW	2	N	2		4	8	4	6								fair milder all day	6		
7	29.825	48	29.800	49	49.0	37.0			46.0	45.2	46.5	46.0	0.27	N	2	N	2		4	5	4	10								do do do	7		
8	29.875	50	29.900	50	49.0	45.0			47.5	47.2	45.4	42.0	0.06	N	2	N	2		4	10	4	8									lost. slight, heavy frost P.M.	8	
9	30.100	47	30.275	49	42.0	40.8			40.2	39.6	38.0	37.4	0.02	N	6	W	6		4	8	4	8									slight showers, cool	9	
10	30.450	45	30.450	50	43.6	36.6			39.0	36.8	36.5	35.0	0.00	N	2	S	2		4	6	0										fair fine all day	10	
11	30.400	45	30.400	50	49.5	29.0			34.0	33.0	36.5	34.0	0.00	SW	2	SW	2		4	3	4	8									fair white frost fair all day	11	
12	30.410	47	30.415	57	52.1	33.4			41.0	39.6	38.5	37.0	0.00	N	2	N	2		4	6	4	6									fair fine all day	12	
13	30.425	45	30.324	45	44.0	34.8			37.0	35.0	36.5	34.0	0.00	N	2	SW	2		4	2	ST	4									do do	13	
14	30.200	48	29.940	52	47.0	37.0			41.5	40.0	38.0	34.0	0.00	SW	2	S	1		4	6	0										fair dull clear P.M.	14	
15	29.650	46	29.400	45	44.0	30.0			35.4	33.0	44.0	43.0	0.12	SW	2	SE	2		4	5	4	6									fair frosty fine all day	15	
16	29.309	48	29.650	48	47.0	34.0			41.5	40.0	37.0	34.0	0.00	SW	2	SW	1		4	5	0										fair dull clear P.M.	16	
17	29.050	40	28.860	48	45.0	32.8			44.0	43.4	44.0	41.0	0.16	S	4	SE	4		4	10	4	10									rain clearing 10 A.M. fine	17	
18	28.850	45	28.775	46	40.0	32.0			38.7	35.1	36.0	35.0	0.08	SW	4	SW	2		4	8	4	10									fair dull some slight rain	18	
19	28.925	47	29.050	47	40.4	31.0			34.1	33.5	36.5	36.0	0.28	SW	2	W	2		4	4	4	10									fair up to 8 P.M. then rain	19	
20	29.245	45	29.500	46	42.1	33.5			38.8	37.2	36.0	34.5	0.00	NW	2	NW	2		4	6	0										fair all day	20	
21	29.625	43	29.725	46	53.2	29.5			30.0	29.2	39.0	31.5	0.09	SW	1	SW	2		4	3	4	8									fair some rain P.M.	21	
22	29.800	49	29.975	54	58.0	36.0			35.2	32.0	52.0	50.0	0.00	SW	2	S	6		4	8	4	8									rain dull all day	22	
23	30.145	52	30.150	54	49.5	38.0			55.0	52.7	57.8	50.0	0.00	SW	6	SW	6		4	8	4	4									fair dull clear P.M.	23	
24	30.175	53	30.250	57	56.8	36.0			52.5	48.5	48.5	47.0	0.00	SW	6	SW	6		4	4	4	5									rain fine, dry in wind	24	
25	30.345	52	30.450	57	50.2	49.5			49.0	47.6	47.5	46.0	0.04	SW	1	SW	1		4	10	0											dull slight rain P.M.	25
26	30.225	52	29.890	56	57.0	47.4			47.0	46.0	41.5	41.0	0.00	SW	2	N	4		4	10	4	6										dull damp changeable	26
27	29.775	57	30.000	50	50.4	40.0			46.4	42.5	45.0	41.0	0.00	W	4	N	2		4	3	4	6									fair fine	27	
28	29.885	57	29.750	54	54.0	48.0			42.5	41.4	45.8	43.0	0.00	SW	2	SW	4		4	4	4	8									do do	28	
29	29.745	57	29.350	58	51.0	48.2			46.5	43.0	47.8	40.5	0.19	SW	2	W	2		4	6	10	10									fair fine rain after 6 P.M.	29	
30	29.500	43	29.350	44	46.0	36.0			38.0	34.8	36.5	35.0	0.12	N	4	N	6		4	6	10										very cold, stormy showers P.M.	30	
31														9																			
Sums.	15107	11	15110	13	136	115			147	110	179	122	292		92	89			194	192													
Means.	29.718	48.6	29.742	50.7	49.0	36.2			42.9	41.1	42.5	40.7		31	30			65	64														
Corrections for Instrumental Errors.	-920		-920																														
Corrections for Diurnal Range.																																	
Corrected Means	29.758		29.722																														

NOTATION USED IN GENERAL REMARKS.											
a.	denotes aurora.										
d.	drizzling rain.										
f.	fog.										
fr.	frost.										
h.-fr.	hoar-frost.										
h.	haze.										
hi.	hail.										
l.	lightning.										
lu. co.	lunar corona.										
lu. ha.	lunar halo.										
m.	mist.										
p.	passing showers.										
rain.	rain.										
r.	heavy rain.										
sl.	sleet.										
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.										

NOTATION USED IN GENERAL REMARKS.			
a.	denotes aurora.		
d.	drizzling rain.		
f.	fog.		
h.	haze.		
h-fr.	hoar-frost.		
h.	hail.		
li.	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. ha.	solar halo.		
q.	squall.		
q.s.	violent squalls.		
t.	thunder.		
t.s.	thunder-storm.		

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

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 29.706
 Corrected Mean at 9 P.M., minus Correction for Temp. = 29.666
 Mean at Station, corrected, and at 32', = 29.704
 Correction for height, feet above Mean Sea-level, = + 50
 Mean, reduced to 32', and Sea-level, = 752
 Highest Reading, corrected for Index error, on the 10 th, 25' = 30.430
 Lowest Do. Do., on the 18 th, = 28.755
 Difference, or Monthly Range, = 1.675

S-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 23 th, = 59.5
 Lowest in Month, corrected for Index errors, on the 21 th, = 28.5
 Difference, or Monthly Range, = 31.0
 Mean of all the Highest, = 49.0
 Mean of all the Lowest, = 38.2
 Difference, or Mean Daily Range, = 10.8
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 43.9
 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, = 42.7
 Wet Bulb, Mean of A.M. and P.M. Readings, = 40.2
 Computed Temperature of Dew-Point, = 38.7
 Do. Elastic Force of Vapour, = 2.35
 Do. Relative Humidity (Saturation = 100), = 86
 RAIN fell on 16 Days; Amount in Inches, = 2.92

WIND.		SUMMARY.							
Direction.		N	NE	E	SE	S	SW	W	NW
A.M.		2	3	2	2	1	5	4	1
P.M.		2	3	2	4	3	9	5	2
Sum.		4	6	4	6	4	14	9	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. Mercuial 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 **BOAZD 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 1/1000 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 Apparent.	In Leaf.	Dried state of Leaves.	CROPS, mentioning variety.	Sorting or Threshing.	Appearance above ground.	In Ear or Plover.	First Cut (or Harvest).
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.	FRUIT RIFE.	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,		
Mezereum,		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
.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 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 sun or moon; 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.

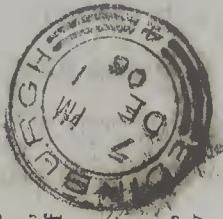
THE SECRETARY,

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 December 1906.
 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 Cross.
 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.				THERMOMETERS under Ground.					GENERAL REMARKS. Occurrences 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 Ball 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.		No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.			No. 48 ins.
	Barometer.	Attached Thermometer.	Barometer.	Attached Thermometer.				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.		No.					No.		No.				No.		No.			No.		No.								
inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.																	
1	29.960	45.	30.125	48.	53.0	36.4	38.0	36.0	40.6	39.0	0.03	NW	4	M	6	Bi	3	Cu	8								1		
2	29.950	48.	29.625	52.	56.0	32.2	51.4	48.9	43.5	43.8	0.02	NW	2	W	4	Bi	4	Bi	6								2		
3	29.960	49.	29.600	51.	50.8	44.2	44.5	40.0	43.5	41.0	0.00	SW	6	NW	4	Bi	2	Bi	4								3		
4	29.950	46.	29.400	52.	50.0	39.0	42.0	41.5	40.5	39.0	0.04	NW	2	NW	6	Bi	8	Bi	4								4		
5	29.955	46.	29.445	49.	42.0	34.0	36.8	32.2	37.5	36.0	0.08	N	2	N	4	Bi	2	Bi	10								5		
6	30.130	45.	30.360	49.	41.7	39.8	40.0	37.5	40.5	38.0	0.00	N	4	N	4	Bi	4	Bi	10								6		
7	30.190	46.	29.860	52.	49.6	36.6	40.0	38.0	42.0	41.0	0.00	SW	2	N	2	Bi	8	Bi	8								7		
8	29.900	48.	29.450	48.	49.6	43.0	45.0	41.0	44.0	43.0	0.12	N	2	SW	2	Bi	8	Bi	0								8		
9	29.570	41.	29.750	43.	35.2	31.0	33.4	31.8	32.5	31.0	0.11	NW	6	NW	4	Bi	4	Bi	6								9		
10	29.525	41.	29.840	43.	34.0	29.8	33.0	31.0	33.0	31.0	0.00	NW	4	NW	2	Bi	5	Bi	8								10		
11	29.680	40.	29.530	44.	37.1	28.6	33.2	32.0	34.0	33.0	0.01	SW	2	SW	2	Bi	8	Bi	0								11		
12	29.200	41.	29.260	43.	38.0	28.0	37.2	36.8	35.5	34.0	0.24	SW	2	NW	2	Bi	8	Bi	10								12		
13	29.300	39.	29.165	39.	35.0	26.0	26.8	26.0	25.0	23.8	0.00	SW	2	SW	2	Bi	2	Bi	0								13		
14	29.450	35.	29.725	41.	34.0	23.6	24.8	22.5	23.0	22.0	0.00	SW	2	SW	1	Bi	2	Bi	0								14		
15	29.775	35.	29.750	39.	29.0	24.0	34.0	35.5	23.0	24.0	0.22	SW	3	SW	2	Bi	2	Bi	4								15		
16	29.580	49.	30.000	42.	39.4	24.0	34.5	33.0	36.0	35.0	0.14	SW	2	SW	2	Bi	8	Bi	5								16		
17	30.100	42.	30.125	48.	51.0	35.0	44.0	43.0	43.0	42.0	0.00	SW	2	SW	2	Bi	5	Bi	8								17		
18	30.255	45.	30.235	49.	46.5	38.8	41.0	40.4	43.0	41.5	0.08	S	2	SW	2	Bi	10	Bi	5								18		
19	30.300	46.	30.345	50.	47.6	40.1	44.0	43.0	42.5	41.0	0.00	SW	2	SW	2	Bi	10	Bi	8								19		
20	30.400	46.	30.570	50.	48.2	43.2	44.5	43.2	45.5	43.0	0.00	SW	2	SW	2	Bi	6	Bi	0								20		
21	30.580	43.	30.600	43.	38.0	32.0	33.0	32.0	36.0	35.0	0.00	SW	2	SW	2	Bi	0	Bi	4								21		
22	30.325	41.	30.345	47.	37.7	32.8	33.6	33.0	36.0	35.0	0.00	SW	2	SW	2	Bi	8	Bi	6								22		
23	30.175	43.	30.045	46.	37.8	31.0	33.8	32.6	34.5	33.0	0.00	SW	2	SW	2	Bi	3	Bi	6								23		
24	29.920	44.	29.760	41.	39.0	32.5	35.8	33.8	28.5	26.0	0.18	SW	2	NW	6	Bi	6	Bi	0								24		
25	29.800	33.	29.500	40.	29.0	29.0	27.0	25.5	26.5	25.0	0.02	NW	8	NW	4	Bi	6	Bi	6								25		
26	29.175	36.	28.960	37.	36.0	23.6	25.8	25.0	26.0	25.5	0.42	W	6	NW	6	Bi	10	Bi	5								26		
27	29.100	38.	29.245	39.	34.8	23.0	33.6	32.4	32.5	31.0	0.90	NW	4	NW	2	Bi	10	Bi	5								27		
28	29.600	37.	29.740	39.	33.0	31.0	31.4	30.5	32.0	31.0	0.83	N	6	N	4	Bi	10	Bi	10								28		
29	29.925	33.	29.825	37.	20.5	18.2	21.0	20.0	18.0	19.0	0.00	NW	2	N	2	Bi	3	Bi	8								29		
30	29.800	28.	29.525	32.	21.0	11.0	18.6	17.5	19.0	18.0	0.00	SW	2	SW	2	Bi	2	Bi	8								30		
31	29.450	32.	29.158	37.	35.6	10.0	20.0	17.0	25.5	24.0	0.45	S	4	SW	2	Bi	8	Bi	10								31		
Sums.	1511	15	1613	15	167	157	139	129	121	123	6	175	172																
Means.	29.71	43	29.78	41	37.1	32.8	33.6	33.0	36.0	35.0	0.14	3.1	3.1																
Corrections for Instrumental Errors.																													
Corrections for Diurnal Range.																													
Corrected Means																													

BAROMETER. Corrected Mean at 9 A.M., minus Correction for Temp. = 35. = 756
 Corrected Mean at 9 P.M., minus Correction for Temp. = 42. = 745
 Mean at Station, corrected, and at 32°, = 731 756
 Correction for height, feet above Mean Sea-level, = + 50 56
 Mean, reduced to 32°, and Sea-level, = 781 806
 Highest Reading, corrected for Index error, on the th, =
 Lowest Do. Do., on the th, =
 Difference, or Monthly Range, =

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the 2 th, = 56.0
 Lowest in Month, corrected for Index errors, on the 30 th, = 31.4
 Difference, or Monthly Range, = 46.0
 Mean of all the Highest, = 39.7
 Mean of all the Lowest, = 30.6
 Difference, or Mean Daily Range, = 9.1
 Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = 35.2
 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, = 34.8
 Wet Bulb, Mean of A.M. and P.M. Readings, = 33.5
 Computed Temperature of Dew-Point, = 31.5
 Do. Elastic Force of Vapour, = 176
 Do. Relative Humidity (Saturation = 100), = 88
 RAIN fell on 17 Days; Amount in Inches, = 3.91

WIND.	SUMMARY.									
	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0-12.
A.M.	2	-	-	-	2	16	2	9	-	
P.M.	4	-	-	-	-	15	4	8	-	
Sum.	6	-	-	-	2	31	6	17	-	3.1

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 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.

FOURTH 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 1/1000 inch, 0.100 inch, and 0.005 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 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.	CROPS, mentioning variety.	Sowing or Planting.	Approaching above ground.	In Ear or in Flower.	First Cut or Raised.
Alder,					Barley,				
Ash,					Bero 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,		
Bouree or Elder,		Black Currant,		Curlew,		
Broom,		Cherry,		House Swallow,		
Hazel,		Gean,		Lapwing,		
Hawthorn,		Gooseberry,		Plover,		
Holly,		Peach,		Sud-Martin,		
Laburnum,		Pear,		Starlings,		
Lilac,		Plum,		Sparrow,		
Mazzeon,		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.

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, Cr. 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 sun or moon; of all Auroras, Meteors, or Halos round the 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.

