

Mr. George P. P. path
43 Leith Road
Leith

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of January 1908.
Lat. 55° 54' N, Long. 3° 10' W, Distance from Sea half miles Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS.				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.		Direction.	Force Scale of 0-12.	Direction.	Force Scale of 0-12.	Amount at 9 A.M.	Species and Direction.	Amount (0-10).	Species and Direction.		Amount (0-10).	9 A.M.						
	Barometer. No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.				Dry bulb.	Wet bulb.	Dry bulb.	Wet bulb.													No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.			No. 48 ins.
1			30.462																						Cloudy; fine.	1				
2			30.512																						Mostly cloudless; thick low h. with thick h. fr.	2				
3			30.424																						Thick h.; sunny at times.	3				
4			30.301																						Cloudy; thick h.	4				
5																										5				
6																										6				
7																										7				
8																										8				
9																										9				
10																										10				
11																										11				
12			30.135																							Fine, sunny.	12			
13			30.104																							Fog - thick at times.	13			
14			29.997																							Fine, hazy; sunny dur. afternoon.	14			
15			29.532																							Fine, except obs. bet. 9-10 a.m.; mostly sunny dur. afternoon; very squally; shaft of sun.	15			
16			29.712																							Squally; obs. early morning; frequent sunshines.	16			
17			29.599																							Squally, dry; cold; brisk w. bet. 0.45-5 p.m.; N. 2-4 p.m. about 4-50 p.m.	17			
18			30.252																							Fine, sunny; cloudless.	18			
19			30.136																							Fine, sunny at times; obs. aft. 5.30 p.m.	19			
20			30.382																							Fine; cloudy, with sunny intervals dur. afternoon.	20			
21			30.378																							Fine; occas. sunshines.	21			
22			30.227																							Fine; sunny at times; rather hazy; evening cloudy.	22			
23			30.446																							Fine; cloudy; a few sh. obs.	23			
24			30.347																							Fog chiefly; obs. early morning.	24			
25			30.022																							Changeable; brisk obs. bet. 0.45-3.30 p.m.; occas. sunshines.	25			
26			29.780																							Squally, with freq. brisk obs. till abt. 11 a.m.; mostly sunny dur. afternoon.	26			
27			29.387																							Changeable; obs. with freq. brisk obs.; sunny at times.	27			
28			29.535																							Squally, dry. till 7.30 a.m.; day fine, mostly sunny; sun till obs. aft. 5 p.m.	28			
29			30.153																							Fine; freq. sunshines; sh. obs. about 11 a.m.	29			
30			29.780																							Cloudy; sun, sh. and r. in succession bet. 7.30-9 a.m.; fine later.	30			
31			29.679																							Mostly sunny till 3 p.m.; obs. aft. noon; freq. r. sun, sh. and obs. aft. 7.30 p.m.	31			
Sums.																														
Means.																														
Correc- tions for Instru- mental Errors.																														
Correc- tions for Diurnal Range.																														
Cor- rected Means																														

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
	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. = _____
Corrected Mean at 9 P.M., minus Correction for Temp. = _____
Mean at Station, corrected, and at 32°, _____
Correction for height, _____ feet above Mean Sea-level, _____ = +
Mean, reduced to 32°, and Sea-level, _____
Highest Reading, corrected for Index error, on the _____ th, _____ =
Lowest Do. Do., _____ on the _____ th, _____ =
Difference, or Monthly Range, _____ =

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

WIND.	SUMMARY.									
	Direction.	N	NE	E	SE	S	SW	W	NW	Mean Force 0-12.
A.M.										
P.M.										
Sum.										

Observations made and
Return verified by _____
(Signed) _____

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

INSTRUCTIONS

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

The errors most frequently made in reading the barometer are mistakes of 1·000 inch, 0·100 inch, and 0·050 inch; that is to say, instead of 29·355 one of the following is sometimes set down—viz. 30·355, 29·255, 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 Raised.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,		Cuckoo,		
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.

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, &c., 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 9 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, &c., 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 Leith, County of Edinburgh, During the MONTH of February 1908.
 Lat. 55° 59' N., Long. 3° 10' W., Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.
 Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER.	Corrected Mean at 9 A.M., <i>minus</i> Correction for	}	=
	Temp. =	}	=
	Corrected Mean at 9 P.M., <i>minus</i> Correction for	}	=
	Temp. =	}	=
<hr/>			
Mean at Station, corrected, and at 32°.....		=	
Correction for height, feet above Mean Sea-level,.....		= +	
Mean, reduced to 32°, and Sea-level,		=	
Highest Reading, corrected for Index error, on the th,.....		=	
Lowest Do. Do., on the th,.....		=	
Difference, or Monthly Range,		=	

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

[illegible]

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

Observations made and
Return verified by

(Signed)

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

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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. Experiences 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.	Last Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, maintaining variety.	Sowing or Planting.	As appearing above Ground.	Bar. Barometer or Fother.	First Cut or Fother.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

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

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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 book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—
·47
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·38
1·37

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

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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.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of March 1908.

Lat. 55° 59' N, Long 3° 10' W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER. Corrected Mean at 9 A.M., minus Correction for }
Temp. =—..... }

Corrected Mean at 9 P.M., *minus* Correction for }
Temp. =—.....

Mean at Station, corrected, and at 32°,.....

Correction for height, feet above Mean Sea-level,.....

Mean, reduced to 32°, and Sea-level,

Highest Reading, corrected for Index error, on the _____th,.....

Lowest Do. Do., on the th,.....

Difference, or **Monthly Range**,

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

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

Difference, or Monthly Range. =

Mean of all the Highest 11

MEAN OF THE TWO HOW USE,

Difference, or Mean Daily Range, =

Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), =

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, =

Wet Bulb, Mean of A.M. and P.M. Readings, =

Computed Temperature of Dew-Point, =

Do Elastic Force of Vapour

Do **Relative Humidity** (Stationing: 100)

1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 25

RAIN fell on Days; Amount in Inches, =

[illegible]

Observations made and
Return verified by

(Signed) _____

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

INSTRUCTIONS

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

The errors most frequently made in reading the barometer are mistakes of 1-1000 inch, 0-100 inch, and 0-050 inch: that is to say, instead of 29-365 one of the following is sometimes set down—viz. 30-365, 29-265, or 29-315. Experience having shown that even the best Observers occasionally make these mistakes, the reading, after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

FOREST TREES.	In Flower.	Leaf Buds first Appear.	In Leaf.	Divested of Leaves.	CROPS, mentioning variety.	Sowing or Planting.	Appearing above Ground.	In Ear or Flower.	First 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.	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,		
Mezreon,		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 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.

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THERMOMETERS UNDER GROUND.

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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.

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SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of April 1908.

Lat. $55^{\circ} 57' N$, Long. $3^{\circ} 10' W$, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 65 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER.	Corrected Mean at 9 A.M., <i>minus</i> Correction for	}	=
	Temp. =		
	Corrected Mean at 9 P.M., <i>minus</i> Correction for	}	=
	Temp. =		
Mean at Station, corrected, and at 32°.....			=
Correction for height,	feet above Mean Sea-level,.....		= +
Mean, reduced to 32°, and Sea-level,			=
Highest Reading, corrected for Index error, on the	th,.....		=
Lowest Do.	Do., on the	th,.....	=
Difference, or Monthly Range,			=

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

[illegible]

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.

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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. Mercorial 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.

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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 29-565 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 Harvested.
Alder,					Barley,				
Ash,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

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

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

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

CLOUDS.

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of May 1908.
Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.
Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER.				SELF-REGISTERING THERMOMETERS.				HYGROMETER.				RAIN.	WIND.				CLOUDS.				SUNSHINE.	THERMOMETERS under Ground.					GENERAL REMARKS.	Days of Month.		
	9 A.M.		9 P.M.		Protected in Screen, 4 feet above Ground.		Black Bulb Max. in Sun.		9 A.M.		9 P.M.			Amount at 9 A.M.	9 A.M.		9 P.M.		Amount at 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. No.	Attached Thermometer.	Barometer. No.	Attached Thermometer.	Max. No.	Min. No.	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).							
1			30.123																										Cloudy; r. till abt. 3 p.m.; sunny, mho. after 4 p.m.; f. at times.	1	
2			30.189																										Cloudy; thick h. at times; occas. drizz. sho.	2	
3			29.922																										Overcast; nearly const. r. bet. 10.30 a.m. and 6 p.m.	3	
4			29.530																										Overcast; drizz. sho. early morning, and const. r. after 6 p.m.	4	
5			29.217																										Cloudy; frequent rain.	5	
6			29.365																										Changeable; showery; r. bet. 5.40 to 6 p.m.; occas. brief sunshine dur. afternoon.	6	
7			29.693																										Fine, except brief sho. bet. 0.45 to 1.15 p.m.; mostly sunny.	7	
8			29.413																										Cloudy; r. early morng. + sho. dur. forenoon; const. r. after 1 p.m.	8	
9			29.660																										Fine, sunny.	9	
10			29.732																										Sho. early morng.; day fine, clear, sunny.	10	
11			29.860																										Fine; bright sunshine at times; a few sh. sho.	11	
12			29.768																										Changeable; fog. r. forenoon; heavy dr. at 1.30 + 2.45 p.m.; occas. sunshine.	12	
13			29.639																										R. early morning; day fine; mostly sunny after 9.30 a.m.	13	
14			29.633																										Fine; cloudy, with occas. sunshine.	14	
15			29.816																										Cloudy; overhauling h.; occas. sh. sunshine; drizz. sho. about 6 p.m.	15	
16			30.090																										Cloudy; fine; occas. sunshine.	16	
17			30.124																										Cloudy; with occas. sunshine; brisk sho. at 4.30 a.m. + a few sh. sho. dur. day.	17	
18			30.310																										Fine; mostly sunny.	18	
19			30.243																										Cloudy; h. to 1.15 p.m. bet. 1.15 to 10.30 a.m.; fog. sunshine after 2.30 p.m.	19	
20			30.064																										Fine, sunny.	20	
21			29.625																										Fine; mostly sunny till noon; a few sh. sho.	21	
22			29.890																										Fine; mostly sunny; cloudy, showery after 5 p.m.	22	
23			30.013																										Fine, sunny; evening cloudy.	23	
24			29.588																										Fine; mostly sunny dur. afternoon; squally at times.	24	
25			29.811																										Fine, sunny; gusty.	25	
26			30.251																										Cloudy; with occas. brief sunshine; mostly sunny after 3 p.m.	26	
27			30.515																										Fine; bright sunshine; mostly cloudless.	27	
28			30.480																										Fine; bright sunshine; cloudless.	28	
29			30.398																										Morning r. drizz. thick overhauling h.; bright sunshine bet. 1 p.m. + 4 p.m.	29	
30			30.136																										Morning thick overhauling h.; day fine, sunny. - T.S. after 10.30 a.m.	30	
31			29.973																										Continuation of T.S. with r. at times till abt. 3.30 a.m.; day fine, mostly sunny.	31	
Sums.			1514.10																												
Means.			28.038																												
Corrections for Instrumental Errors.																															
Corrections for Diurnal Range.																															
Corrected Means																															

NOTATION USED IN GENERAL REMARKS.

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

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

S.-R. THERMOMETER, (in shade) Highest in Month, corrected for Index Errors, on the _____ th, = _____
Lowest in Month, corrected for Index errors, on the _____ th, = _____
Difference, or Monthly Range, = _____
Mean of all the Highest, = _____
Mean of all the Lowest, = _____
Difference, or Mean Daily Range, = _____
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), = _____
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, = _____
Wet Bulb, Mean of A.M. and P.M. Readings, = _____
Computed Temperature of Dew-Point, = _____
Do. Elastic Force of Vapour, = _____
Do. Relative Humidity (Saturation = 100), = _____
Days; Amount in Inches, = _____

WIND.	SUMMARY.										
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.	
A.M.											
P.M.											
Sum.											

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. Mercorial 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:—

Then 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.	Disputed of Leaves.	GROUPS mentioning variety.	Sowing or Planting.	Applying above Ground.	In Ear or Flower.	First Out or Raised.
Alder,					Barley,				
Ash,					Barley or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Larch,					Beans,				
Lime,					Pease,				
Oak,					Potatoes,				
Sycamore or Plane,					Turnips,				
					Rye Grass,				

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

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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.

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SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of June 1908.
 Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground. _____ feet _____ inches.

The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER.	Corrected Mean at 9 A.M., <i>minus</i> Correction for	=	_____
	Temp. = _____	}	_____
	Corrected Mean at 9 P.M., <i>minus</i> Correction for	=	_____
	Temp. = _____	}	_____
Mean at Station, corrected, and at 32°,		=	_____
Correction for height,	feet above Mean Sea-level,	=	+ _____
Mean, reduced to 32°, and Sea-level,		=	_____
Highest Reading, corrected for Index error, on the	th,	=	_____
Lowest Do.	Do., on the	th,	= _____
Difference, or Monthly Range,		=	_____

S.-R. THERMOMETER, (in shade)	Highest in Month,	corrected for Index Errors, on the	th,	.....	=
	Lowest in Month,	corrected for Index errors, on the	th,	.....	=
	Difference, or Monthly Range,	.....			=
	Mean of all the Highest,	.....			=
	Mean of all the Lowest,	.....			=
	Difference, or Mean Daily Range,	.....			=
	Mean Temperature	of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.),		 =
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, = _____
Wet Bulb, Mean of A.M. and P.M. Readings, = _____
Computed Temperature of Dew-Point, = _____
 Do. **Elastic Force of Vapour,** = _____
 Do. **Relative Humidity (Saturation = 100), =** _____
 Do. **Days: Amount in Inches,** = _____

[illegible]

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.

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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 Talcum 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, 0.001 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 Out or Rained.
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,		Curdew,		
Broom,		Cherry,		House-Swallow,		
Hazel,		Gean,		Lapwing,		
Hawthorn,		Gooseberry,		Plover,		
Holly,		Peach,		Sand-Martin,		
Laurum,		Pear,		Starling,		
Lilac,		Plum,		Swan,		
Mezeron,		Strawberry,		Rail or Corn Crane,		
Mountain Ash or Rowan,						
Red Flowering Currant,						
Rhododendron Ponticum,						
Whin,						

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

FOR TAKING METEOROLOGICAL OBSERVATIONS.

RAIN GAUGE.

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

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

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

47
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.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Lith, County of Edinburgh, During the MONTH of July 1908

Lat 55° 59' N, Long 3° 10' W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER. Corrected Mean at 9 A.M., *minus* Correction for }
 Temp. = }
 Corrected Mean at 9 P.M., *minus* Correction for }
 Temp. = }

Mean at Station, corrected, and at 32°, =
 Correction for height, feet above Mean Sea-level, = +
 Mean, reduced to 32°, and Sea-level, =
 Highest Reading, corrected for Index error, on the th, =
 Lowest Do. Do., on the th, =
 Difference, or **Monthly Range**, =

S.-R. THERMOMETER, (in shade) Highest in Month,	corrected for Index	
Errors, on the	th, =
Lowest in Month,	corrected for Index errors, on the	th, =
Difference, or Monthly Range,	 =
Mean of all the Highest,	 =
Mean of all the Lowest,	 =
Difference, or Mean Daily Range,	 =
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.),	 =
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,	=	_____
Wet Bulb, Mean of A.M. and P.M. Readings,	=	_____
Computed Temperature of Dew-Point,	=	_____
Do. Elastic Force of Vapour,	=	_____
Do. Relative Humidity (Saturation = 100), =		_____
RAIN fell on _____ Days: Amount in Inches,	=	_____

[illegible]

Observations made and
Return verified by

(Signed).

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

INSTRUCTIONS

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

In the BOARD 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.	Directed of Leaves.	GROUPS 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.	FRUIT.	First in Blossom generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,		Cuckoo,		
Bourtree or Elder,		Black Currant,		Curlew,		
Broom,		Cherry,		House-Sparrow,		
Hazel,		Gean,		Lapwing,		
Hawthorn,		Gooseberry,		Plover,		
Holly,		Peach,		Sand-Martin,		
Labrum,		Pear,		Starling,		
Lilac,		Plum,		Swan,		
Mezreon,		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 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 Leith, County of Edinburgh, During the MONTH of August 1908.
 Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.
 Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER.	Corrected Mean at 9 A.M., <i>minus</i> Correction for	}	=	_____
	Temp. =	_____	}	_____
	Corrected Mean at 9 P.M., <i>minus</i> Correction for	}	=	_____
	Temp. =	_____	}	_____
Mean at Station, corrected, and at 32°,	_____	=	_____	_____
Correction for height,	feet above Mean Sea-level, _____	= +	_____	_____
Mean, reduced to 32°, and Sea-level,	_____	=	_____	_____
Highest Reading, corrected for Index error, on the	th, _____	=	_____	_____
Lowest Do.	Do., _____ on the	th, _____	=	_____
Difference, or Monthly Range,	_____	=	_____	_____

S.-R. THERMOMETER, (in shade) Highest in Month,	corrected for Index	
Errors, on the	th, =
Lowest in Month,	corrected for Index errors, on the	th, =
Difference, or Monthly Range,	 =
Mean of all the Highest,	 =
Mean of all the Lowest,	 =
Difference, or Mean Daily Range,	 =
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.),	 =
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, =
Wet Bulb, Mean of A.M. and P.M. Readings, =
Computed Temperature of Dew-Point, =
 Do. **Elastic Force of Vapour,** =
 Do. **Relative Humidity** (Saturation = 100), =
RAIN fell on **Days: Amount in Inches,** =

WIND.						SUMMARY.				
Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0-12.
A.M.										
P.M.										
Sum.										

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.

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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.

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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.

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 Fountin 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 readings, after it is written down, should be compared again with the scale.

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

SHRUBS, ETC.	First in Blossom.	FRUITS.	Fruit ripe, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,		Chukoo,		
Bourtree or Elder,		Black Currant,		Cunlew,		
Broom,		Cherry,		House-Swallow,		
Hazel,		Gean,		Lapwing,		
Hawthorn,		Gooseberry,		Plover,		
Holly,		Peach,		Sand-Martin,		
Laburnum,		Pear,		Starling,		
Lilac,		Plum,		Swan,		
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.

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.

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·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; 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 Leith, County of Edinburgh, During the MONTH of September 1908.
 Lat. 55° 57' N, Long. 3° 10' W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER.	Corrected Mean at 9 A.M., <i>minus</i> Correction for	{	=	_____
	Temp. =	_____	}	_____
	Corrected Mean at 9 P.M., <i>minus</i> Correction for	{	=	_____
	Temp. =	_____	}	_____
<hr/>				
Mean at Station, corrected, and at 32°,	_____	=	_____	_____
Correction for height, feet above Mean Sea-level,	_____	= +	_____	_____
Mean, reduced to 32°, and Sea-level,	_____	=	_____	_____
Highest Reading, corrected for Index error, on the th,	_____	=	_____	_____
Lowest Do. Do., on the th,	_____	=	_____	_____
Difference, or Monthly Range,	_____	=	_____	_____

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

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

Difference, or **Monthly Range**, =

Mean of all the Highest, =

Mean of all the Lowest, 111

Difference, or Mean Daily Range..... =

Mean Temperature of Month. $\frac{1}{2}$ (Mean Max. + Mean Min.), =

D. THERMOMETER Min. on Grass Lowest in Month

Black Bull Max in Sun Highest in Month

HYGROMETER, Dry Bulb, Mean of A.M. and P.M. Readings, =

Wet Bulb, Mean of A.M. and P.M. Readings, =

Computed Temperature of Dew-Point, =

Do. Elastic Force of Vapour, =

Do. **Relative Humidity** (Saturation = 100), =

Days; Amount in Inches, =

[illegible]

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

Observations made and
Return verified by

(Signed) _____

INSTRUCTIONS

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

In the BOARD or FRANKS 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, 0.001 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.	Last 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,					Bere or Bigg,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

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

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

FOR TAKING METEOROLOGICAL OBSERVATIONS.

STEVENSON SCREEN.

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

MAXIMUM AND MINIMUM THERMOMETERS.

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

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

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

DRY AND WET BULB THERMOMETERS.

The Hygrometer in use at the Society's Stations consists of two thermometers—a Dry and a Wet Bulb—of similar form, and usually mounted on one frame. The bulbs should project at least an inch from the frame, and the Wet Bulb be covered with muslin and connected by strands of cotton with the water cistern. This cistern should be placed an inch or two below the level of the bulbs and at the side of the Wet Bulb furthest from the Dry Bulb; it should not stand directly under the Wet Bulb. 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 fly-leaf 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 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.

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SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of October 1908.
 Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.
 Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____
 The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER.	Corrected Mean at 9 A.M., <i>minus</i> Correction for	} =	
	Temp. =	}	
	Corrected Mean at 9 P.M., <i>minus</i> Correction for	} =	
	Temp. =	}	
Mean at Station, corrected, and at 32°,		=	
Correction for height,	feet above Mean Sea-level,	= +	
Mean, reduced to 32°, and Sea-level,		=	
Highest Reading, corrected for Index error, on the	th,	=	
Lowest Do.	Do., on the	th,	=
Difference, or Monthly Range,		=	

S.-R. THERMOMETER,	(in shade)	Highest in Month,	corrected for Index	
Errors, on the	th,			= _____
Lowest in Month,	corrected for Index errors, on the	th,		= _____
Difference, or Monthly Range,				= _____
Mean of all the Highest,				= _____
Mean of all the Lowest,				= _____
Difference, or Mean Daily Range,				= _____
Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.),				= _____
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, = _____

Wet Bulb, Mean of A.M. and P.M. Readings, = _____

Computed Temperature of Dew-Point, = _____

Do. **Elastic Force of Vapour,** = _____

Do. **Relative Humidity (Saturation = 100), =** _____

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

[illegible]

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.

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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.

FOURIN 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.	Dressed of Leaves.	CROPS mentioning variety.	Spring or Planting.	Appearance above Ground.	In Ear or Flower.	First Out or Raised.
Alder,					Barley,				
Ash,					Bers 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.	Fruit Ripe generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,			Cuckoo,		
Boutree or Elder,		Black Currant,			Cunlew,		
Broom,		Cherry,			House-Swallow,		
Hazel,		Gean,			Lapwing,		
Hawthorn,		Gooseberry,			Plover,		
Holly,		Peach,			Sand-Martin,		
Laburnum,		Pear,			Starling,		
Lilac,		Plum,			Swan,		
Mezaron,		Strawberry,			Rail or Corn 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.

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.

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REMARKS.

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

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

ADDITIONAL REMARKS.



SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of November 1908

Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half miles. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground 3 feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

Days of Month.	BAROMETER. <i>at Ft. W. D. 32°9 sea-level.</i>				SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M.				HYGROMETER.		RAIN.	WIND.				CLOUDS.				SUNSHINE. Hours.	THERMOMETERS under Ground.					GENERAL REMARKS. Occurrence of Snow, Hail, Thunder, Lightning, Fog, Gales, Meteors, Auroras, Remarkable Depression or Elevation of Barometer, etc. <i>Mention the hour at which Storms, including Thunder and Lightning, began and ended.</i>	Days of Month.				
	9 A.M.		9 P.M.		Protected in Screen, 4 feet above Ground.		Black Bulb Max. in Sun. No.	Min. on Grass. No.	9 A.M.			9 P.M.		Amount at 9 A.M.	9 A.M.		Anemometer. 9 A.M.	9 A.M.			9 P.M.		9 A.M.								
	Barometer. No.	Attached Ther-mometer	Barometer. No.	Attached Ther-mometer	Max. No.	Min. No.			Dry bulb.	Wet bulb.		Dry bulb.	Wet bulb.		Direction.	Force. Scale of 0—12.		Direction.	Force. Scale of 0—12.		Species and Direction.	Amount (0—10).	Species and Direc-tion.	Amount (0—10).	No. 3 ins.			No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.
inches.	"	inches.	"	"	"	"	"	"	"	inches.																					
1			30.130																					Fine; hazy; slight sunshine at times.	1						
2			30.084																					Overcast; const. r. bet. 6.30 am. and 4 p.m.	2						
3			30.075																					Overcast.	3						
4			30.165																					Fine; mostly cloudy.	4						
5			30.126																					Cloudy; dull; sl. sho. after 8.20 p.m.	5						
6			30.130																					Cloudy; fine.	6						
7			29.881																					Fine; occas. sunshine; hazy p.	7						
8			29.858																					Morng & eve. f. with thick h.-fr.; day fine, mostly sunny dur. afternoon.	8						
9			29.897																					Lt. f. with occas. sl. sunshine.	9						
10			29.743																					Thick fog with disquieting at times; evening overcast; r. after 3 p.m.	10						
11			29.515																					Overcast; fog in the morning; heq. drizg. rain.	11						
12			29.833																					Rain prev. night; day fine, mostly sunny.	12						
13			29.888																					Fine; sunny; hazy p.	13						
14			30.138																					Mostly overcast; fog v. till noon; sl. sunshine about 3 p.m.	14						
15			30.127																					Fine; low haze; mostly sunny after noon.	15						
16			29.829																					Cloudy; showers after 11.30 am.; clearing - <u>Sun-ho.</u> at 6 am.	16						
17			30.112																					Fine; sunny; pass. sh. at 3 p.m.	17						
18			29.767																					Changeable; showery; sunny at times.	18						
19			30.117																					Fine; mostly sunny; clear.	19						
20			29.819																					Cloudy; more fog; drizg. sleet bet. 9 am. noon; sunny inter. afternoon; evening clear.	20						
21			29.342																					Overcast; nearly const. r. after 1.30 p.m.	21						
22			28.882																					Changeable; squally; fog v. sho. after 0.40 p.m.; sunny intervals.	22						
23			30.023																					Equally early morning; day fine, mostly sunny.	23						
24			29.552																					Cloudy; squally; fog sho. after 4.20 p.m. very heavy at 5.30 p.m.	24						
2																															

BAROMETER.	Corrected Mean at 9 A.M.,	<i>minus</i> Correction for } =
	Temp. =	Temp. =
	Corrected Mean at 9 P.M.,	<i>minus</i> Correction for } =
	Temp. =	Temp. =
	Mean at Station, corrected, and at 32°, =
	Correction for height, feet above Mean Sea-level,.....	= +
	Mean, reduced to 32°, and Sea-level, =
	Highest Reading, corrected for Index error, on the th,.....	=
	Lowest Do. Do., on the th,.....	=
	Difference, or Monthly Range, =

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

[illegible]

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.

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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 1·000 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.	Dressed of Leaves.	CROPS, mentioning variety.	Swing or Planting.	Asperging above Ground.	In Bar or Flower.	First Cut or Haled.
Alder,					Barley,				
Ash,					Bere or Biggs,				
Beech,					Oats,				
Birch,					Wheat,				
Elm,					Beans,				
Larch,					Pease,				
Lime,					Potatoes,				
Oak,					Turnips,				
Sycamore or Plane,					Rye Grass,				

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,		Cuckoo,		
Bourtree or Elder,		Black Currant,		Cunlew,		
Broom,		Cherry,		House-Swallow,		
Hazel,		Gean,		Lapwing,		
Hawthorn,		Gooseberry,		Plover,		
Holly,		Peach,		Sand-Martin,		
Laburnum,		Pear,		Starlings,		
Lilac,		Plum,		Swan,		
Mezezon,		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.

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SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of December 1908

Lat. 55° 59' N, Long. 3° 10' W, Distance from Sea half mile. Height of Cistern of the Barometer above Mean Sea-Level 55 feet, above Ground three feet.

Diameter of Rain Gauge _____ inches. Height of Rim of Gauge above Ground _____

The Hours of Observation are of Greenwich Time.

[illegible]

BAROMETER.	Corrected Mean at 9 A.M., <i>minus</i> Correction for }	=	
	Temp. =	}	
	Corrected Mean at 9 P.M., <i>minus</i> Correction for }	=	
	Temp. =	}	
Mean at Station, corrected, and at 32°,		=	
Correction for height,	feet above Mean Sea-level,	= +	
Mean, reduced to 32°, and Sea-level,		=	
Highest Reading, corrected for Index error, on the th,		=	
Lowest	Do. Do., on the th,	=	
Difference, or Monthly Range ,		=	

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

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

Difference, or **Monthly Range**, = _____

Mean of all the Highest, =

Mean of all the Lowest, =

Difference, or **Mean Daily Range**, =Mean Temperature of Month, $\frac{1}{2}$ (Mean Max. + Mean Min.), =

TERMINOLOGY Min. on Grass, Lowest in Month

Black Bull Max in Sun Highest in Month

1990-1991 = 100; 1992-1993 = 100; 1994-1995 = 100; 1996-1997 = 100; 1998-1999 = 100; 2000-2001 = 100; 2002-2003 = 100; 2004-2005 = 100; 2006-2007 = 100; 2008-2009 = 100; 2010-2011 = 100; 2012-2013 = 100; 2014-2015 = 100; 2016-2017 = 100; 2018-2019 = 100; 2020-2021 = 100; 2022-2023 = 100; 2024-2025 = 100; 2026-2027 = 100; 2028-2029 = 100; 2030-2031 = 100; 2032-2033 = 100; 2034-2035 = 100; 2036-2037 = 100; 2038-2039 = 100; 2040-2041 = 100; 2042-2043 = 100; 2044-2045 = 100; 2046-2047 = 100; 2048-2049 = 100; 2050-2051 = 100; 2052-2053 = 100; 2054-2055 = 100; 2056-2057 = 100; 2058-2059 = 100; 2060-2061 = 100; 2062-2063 = 100; 2064-2065 = 100; 2066-2067 = 100; 2068-2069 = 100; 2070-2071 = 100; 2072-2073 = 100; 2074-2075 = 100; 2076-2077 = 100; 2078-2079 = 100; 2080-2081 = 100; 2082-2083 = 100; 2084-2085 = 100; 2086-2087 = 100; 2088-2089 = 100; 2090-2091 = 100; 2092-2093 = 100; 2094-2095 = 100; 2096-2097 = 100; 2098-2099 = 100; 2100-2101 = 100; 2102-2103 = 100; 2104-2105 = 100; 2106-2107 = 100; 2108-2109 = 100; 2110-2111 = 100; 2112-2113 = 100; 2114-2115 = 100; 2116-2117 = 100; 2118-2119 = 100; 2120-2121 = 100; 2122-2123 = 100; 2124-2125 = 100; 2126-2127 = 100; 2128-2129 = 100; 2130-2131 = 100; 2132-2133 = 100; 2134-2135 = 100; 2136-2137 = 100; 2138-2139 = 100; 2140-2141 = 100; 2142-2143 = 100; 2144-2145 = 100; 2146-2147 = 100; 2148-2149 = 100; 2150-2151 = 100; 2152-2153 = 100; 2154-2155 = 100; 2156-2157 = 100; 2158-2159 = 100; 2160-2161 = 100; 2162-2163 = 100; 2164-2165 = 100; 2166-2167 = 100; 2168-2169 = 100; 2170-2171 = 100; 2172-2173 = 100; 2174-2175 = 100; 2176-2177 = 100; 2178-2179 = 100; 2180-2181 = 100; 2182-2183 = 100; 2184-2185 = 100; 2186-2187 = 100; 2188-2189 = 100; 2190-2191 = 100; 2192-2193 = 100; 2194-2195 = 100; 2196-2197 = 100; 2198-2199 = 100; 2200-2201 = 100; 2202-2203 = 100; 2204-2205 = 100; 2206-2207 = 100; 2208-2209 = 100; 2210-2211 = 100; 2212-2213 = 100; 2214-2215 = 100; 2216-2217 = 100; 2218-2219 = 100; 2220-2221 = 100; 2222-2223 = 100; 2224-2225 = 100; 2226-2227 = 100; 2228-2229 = 100; 2230-2231 = 100; 2232-2233 = 100; 2234-2235 = 100; 2236-2237 = 100; 2238-2239 = 100; 2240-2241 = 100; 2242-2243 = 100; 2244-2245 = 100; 2246-2247 = 100; 2248-2249 = 100; 2250-2251 = 100; 2252-2253 = 100; 2254-2255 = 100; 2256-2257 = 100; 2258-2259 = 100; 2260-2261 = 100; 2262-2263 = 100; 2264-2265 = 100; 2266-2267 = 100; 2268-2269 = 100; 2270-2271 = 100; 2272-2273 = 100; 2274-2275 = 100; 2276-2277 = 100; 2278-2279 = 100; 2280-2281 = 100; 2282-2283 = 100; 2284-2285 = 100; 2286-2287 = 100; 2288-2289 = 100; 2290-2291 = 100; 2292-2293 = 100; 2294-2295 = 100; 2296-2297 = 100; 2298-2299 = 100; 2300-2301 = 100; 2302-2303 = 100; 2304-2305 = 100; 2306-2307 = 100; 2308-2309 = 100; 2310-2311 = 100; 2312-2313 = 100; 2314-2315 = 100; 2316-2317 = 100; 2318-2319 = 100; 2320-2321 = 100; 2322-2323 = 100; 2324-2325 = 100; 2326-2327 = 100; 2328-2329 = 100; 2330-2331 = 100; 2332-2333 = 100; 2334-2335 = 100; 2336-2337 = 100; 2338-2339 = 100; 2340-2341 = 100; 2342-2343 = 100; 2344-2345 = 100; 2346-2347 = 100; 2348-2349 = 100; 2350-2351 = 100; 2352-2353 = 100; 2354-2355 = 100; 2356-2357 = 100; 2358-2359 = 100; 2360-2361 = 100; 2362-2363 = 100; 2364-2365 = 100; 2366-2367 = 100; 2368-2369 = 100; 2370-2371 = 100; 2372-2373 = 100; 2374-2375 = 100; 2376-2377 = 100; 2378-2379 = 100; 2380-2381 = 100; 2382-2383 = 100; 2384-2385 = 100; 2386-2387 = 100; 2388-2389 = 100; 2390-2391 = 100; 2392-2393 = 100; 2394-2395 = 100; 2396-2397 = 100; 2398-2399 = 100; 2400-2401 = 100; 2402-2403 = 100; 2404-2405 = 100; 2406-2407 = 100; 2408-2409 = 100; 2410-2411 = 100; 2412-2413 = 100; 2414-2415 = 100; 2416-2417 = 100; 2418-2419 = 100; 2420-2421 = 100; 2422-2423 = 100; 2424-2425 = 100; 2426-2427 = 100; 2428-2429 = 100; 2430-2431 = 100; 2432-2433 = 100; 2434-2435 = 100; 2436-2437 = 100; 2438-2439 = 100; 2440-2441 = 100; 2442-2443 = 100; 2444-2445 = 100; 2446-2447 = 100; 2448-2449 = 100; 2450-2451 = 100; 2452-2453 = 100; 2454-2455 = 100; 2456-2457 = 100; 2458-2459 = 100; 2460-2461 = 100; 2462-2463 = 100; 2464-2465 = 100; 2466-2467 = 100; 2468-2469 = 100; 2470-2471 = 100; 2472-2473 = 100; 2474-2475 = 100; 2476-2477 = 100; 2478-2479 = 100; 2480-2481 = 100; 2482-2483 = 100; 2484-2485 = 100; 2486-2487 = 100; 2488-2489 = 100; 2490-2491 = 100; 2492-2493 = 100; 2494-2495 = 100; 2496-2497 = 100; 2498-2499 = 100; 2500-2501 = 100

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[illegible]

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

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

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

DATES IN CONNECTION WITH THE PERIODICAL RETURN OF THE SEASONS.

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

SHRUBS, ETC.	First in Blossom.	FRUITS.	First in Blossom, generally.	MIGRATORY BIRDS.	First Arrival.	Departure.
Barberry,		Apple,		Cuckoo,		
Bountree or Elder,		Black Currant,		Curlew,		
Broom,		Cherry,		House-Swallow,		
Hazel,		Gean,		Lapwing,		
Hawthorn,		Gooseberry,		Plover,		
Holly,		Peach,		Sand-Martin,		
Laburnum,		Pear,		Starling,		
Lilac,		Plum,		Swan,		
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 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 the Screen 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. Muslin and strands are supplied to most stations from the Society's office, and should be renewed at least once a month. In putting on a fresh muslin care should be taken to touch it as little as may be with the fingers. In frosty weather the strands do not convey water to the muslin, but an accurate observation can generally be insured by soaking the Wet Bulb in water a quarter of an hour before the observation, as from the film of ice thus formed on the muslin evaporation goes on in the same way as from the wet muslin under ordinary circumstances.

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 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.