SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of January 1909.

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. corr. + red. to 32° + sea-level. 9 A.M. Barometer. No. ____	9 A.M. Attached Thermometer	9 P.M. Barometer. No. ____	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No. ____	Min. No. ____	Black Bulb Max. in Sun. No. ____	Min. on Grass. No. ____	HYGROMETER. Dry No. ____ Wet No. ____ 9 A.M. Dry bulb.	9 A.M. Wet bulb.	9 P.M. Dry bulb.	9 P.M. Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	9 A.M. Force. Scale of 0—12.	9 P.M. Direction.	9 P.M. Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	9 A.M. Amount (0—10).	9 P.M. Species and Direction.	9 P.M. Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	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.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.												°	°	°	°	°		
1			30·334																						Cloudy; rather equally at times.	1
2			30·440																						Fine; mostly sunny.	2
3			30·473																						Fine; cloudy, with occas. brief sunshine.	3
4			30·574																						Fine, sunny.	4
5			30·333																						Dull; sli. shs. bet. 9 & 8 am.	5
6			30·051																						Overcast, drizz. r. at times aft. 4.15 am.; sunny intvs. dur. afternoon.	6
7			29·797																						Cloudy; freq. hy. shs. & sleet bet. 9 am. & 3 pm.; sunny intvs. after 3 pm.	7
8			30·191																						Fine, sunny; equally.	8
9			29·819																						Mostly cloudy; a few sli. shs.	9
10			29·435																						Cloudy; sli. shs. at 3.45 pm. & mod. shs. after 8.30 pm.	10
11			29·140																						Changeable; freq. heavy shs.; sunny at times; equally.	11
12			29·641																						R. prev. night; day fine, sunny at times.	12
13			28·812																						Cloudy; equally; freq. heavy r. shs. chiefly after 1.15 pm.	13
14			28·661																						Changeable; heavy sqs. with freq. brisk r. shs. bet. 3 am. & 11 am.; sunny intvs.; sunny & fine bet. r. & sn. after 3 pm.	14
15			29·003																						Changeable; equally; freq. brisk sn. shs.; sunny intvs. after 1.15 pm.	15
16			29·633																						Changeable; heavy sn. bet. 6 & 6.30 am. & freq. sn. shs. dur. forenoon; sl. r. shs. bet. noon & 1 pm.; sunny at times.	16
17			29·463																						Overcast; very squally, with freq. heavy r. shs.	17
18			29·592																						Strong sqs. with freq. hy. shs. early a.; sunny; day squally; sunny intvs. dur. forenoon; showery after 1 pm.	18
19			30·120																						Fine; mostly sunny; cloudless at times.	19
20			30·476																						Fine; sunny at times; hazy.	20
21			30·375																						Cloudy; hazy; warmer; mists & clearer.	21
22			30·308																						Overcast; freq. drizz. r.; hazy.	22
23			30·181																						Cloudy; rather hazy.	23
24			30·180																						Fine; cloudy, with occas. brief sunshine.	24
25			30·352																						Warmer f., with thick h.-fr.; day fine, sunny at times; hazy.	25
26			30·448																						Fine; mostly hazy.	26
27			30·334																						Fine; sunny bet. 11 am. & 3 pm.; thick h. at times.	27
28			30·074																						Fine; occas. sunshine; sli. shs. at times after 3 pm.	28
29			29·925																						Fine, cloudy; occas. sunshine.	29
30			30·110																						Fine; mostly cloudy; sli. sn. shs. early morning.	30
31			29·854																						Cloudy; fine.	31
Sums.			1214·9																												
Means.			29·079																												
Corrections for Instrumental Errors.			29·938																												
Corrections for Diurnal Range.																															
Corrected Means																															

13th. 10 pm. 28·808 inches.
14th. 6 am. 28·731 "
" 7 am. 28·773 "
" 7 pm. 28·857 "
" 8 pm. 28·758 "
" 10 pm. 28·545 "

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.		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, ½ (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, ____ =

M. Readings, ____ =

Dew-Point, ____ =

Vapour, ____ =

(Saturation = 100), =

Days, Amount in Inches, ____ =

Mr George Redpath
43 Lochend Road
Leith

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 FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

The errors most frequently made in reading the barometer are mistakes of 1·000 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 writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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 flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

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,		
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.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of February 1909.

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. corr. & red. to 32° and sea-level. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	9 A.M. Wet bulb.	9 P.M. Dry bulb.	9 P.M. Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	9 A.M. Force. Scale of 0—12.	9 P.M. Direction.	9 P.M. Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	9 A.M. Amount (0—10).	9 P.M. Species and Direction.	9 P.M. Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	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.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.												°	°	°	°	°		
1			30·062																						Fine, sunny.						1
2			29·502																						Cloudy; occ. slt. shs. evening.						2
3			29·460																						Cloudy; drizzly with shs at int. 4–6 a.m. & frq. p. dur. day; occ. at times.						3
4			29·583																						Cloudy; fine.						4
5			29·993																						Recent shs early morning; day fine, mostly sunny.						5
6			30·164																						Fine, sunny.						6
7			30·025																						Morng. thick h.-fr.; day fine, mostly cloudy.						7
8			29·984																						Fine; occas. sunshine; hazy.						8
9			29·261																						Overcast; frq. r. during afternoon.						9
10			29·739																						Overcast; frequent r.						10
11			30·276																						Cloudy; frq. drizz. r. shs with small hl. at times.						11
12			30·523																						Cloudy; fine.						12
13			30·542																						Fine; sunny; mostly cloudless.						13
14			30·219																						Cloudy; after slt. shs; rath. squally at times.						14
15			30·229																						Cloudy, with occas. sunshine dur. forenoon; shs after 2.30 p.m.						15
16			30·131																						Fine; mostly sunny; hazy.						16
17			29·943																						Dull; hazy; li. shs during afternoon.						17
18			29·995																						Fine; mostly sunny; hazy; evening cloudy.						18
19			30·129																						Morning, thick h.-fr.; day fine, sunny; hazy.						19
20			30·281																						Mostly sunny; hazy.						20
21			30·368																						Fine; bright sunshine; thick h.-fr. in the morning.						21
22			30·443																						Fine; sunny at times; hazy.						22
23			30·418																						Cloudy; f. with drizz. r. till about 1 p.m.; clearer later.						23
24			30·430																						Morning, overcast; r. till about 9 a.m.; sunny at times dur. afternoon.						24
25			30·533																						Cloudy; hazy.						25
26			30·469																						Cloudy; fine.						26
27			30·444																						Cloudy; shs after 11.15 a.m.						27
28			29·980																						Cloudy, with occas. brief sunshine after 11.45 a.m.; li. sn. shs at 8.55 a.m. & thick hl. shs at 1.55 p.m.						28
29																															29
30																															30
31																															31
Sums.																															
Means.																															
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.
s.	,,	passing showers.
r.	,,	rain.
r.²	,,	heavy rain.
sl.	,,	sleet.
sn.	,,	snow.
so. ha.	,,	solar halo.
q.	,,	squall.
q.²	,,	violent squalls.
t.	,,	thunder.
t. s.	,,	thunder-storm.

CLOUDS.

HIGH CLOUDS.

Cirrus, ...	cir.
Cirro-stratus, . .	cir.-str.
Cirro-cumulus, . .	cir.-cum.

MIDDLE CLOUDS.

Strato-cirrus, . .	str.-cir.
Cumulo-cirrus, . .	cum.-cir.

LOWER CLOUDS.

Strato-cumulus, . .	str.-cum.
Cumulus, ...	cum.
Cumulo-nimbus, . .	cum.-nim.
Nimbus, ...	nim.
Stratus, ...	str.

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

FORCE.		FORCE.		FORCE.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
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, ½ (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 FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

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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 writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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 flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

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,		
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.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of March 1909.

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. corr.d & red. to 32° & sea-level. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	9 A.M. Wet bulb.	9 P.M. Dry bulb.	9 P.M. Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	9 A.M. Force. Scale of 0—12.	9 P.M. Direction.	9 P.M. Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	9 A.M. Amount (0—10).	9 P.M. Species and Direction.	9 P.M. Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	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.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.												°	°	°	°	°		
1			29.651																						Cloudy; a few li. shs. of soft hl.	1
2			29.375																						Changeable; freq. sn. shs. till 8 a.m., & brisk hl. sh. at 2.40 p.m.; sunny at times.	2
3			29.423																						Fine; freq. sunshine; T. & L. at 7.30 p.m., followed by heavy sn. after 7.30 p.m.	3
4			29.500																						Heavy sn. bet. 3.40 & 5 a.m.; day fine, sunny at times.	4
5			29.499																						Fine, sunny.	5
6			29.315																						Cloudy; occas. sunshine dur. afternoon; sn. & sl. after 9 p.m., with Ely gale.	6
7			29.283																						Overcast; sn. shs. prev. night, & freq. sl. & sn. during day.	7
8			29.905																						Cloudy, with occas. sunshine; brisk shs. at 0.30 p.m., and pass. shs. later.	8
9			29.932																						Cloudy; freq. brisk shs. of hl., sl. and sn. after 8.30 a.m.	9
10			30.054																						Changeable; freq. shs. of sn., sl. and rain; sunny at times after 11.40 a.m.	10
11			30.182																						Cloudy; freq. sn., sl. & r. shs., with brisk hail at 1.35 p.m.	11
12			30.091																						Fine, mostly sunny till 3 p.m., then showery; hazy.	12
13			29.670																						Cloudy; sn. & sl. shs. abt. 8.30 a.m., & r. shs. later; sunny bet. dur. afternoon.	13
14			29.365																						Fine; sunny till about noon and aft. 3.30 p.m.; cl. & shs. at times afternoon.	14
15			29.520																						Sn. prev. night; day fine, sunny at times; li. sn. shs. at 3.30 p.m.	15
16			29.489																						Fine; mostly sunny.	16
17			29.254																						Morning thick h.-fr.; day fine, sunny; evng. cloudy, with shs. aft. 7.15 p.m.	17
18			29.115																						Cloudy, with occas. sunshine in morning; a few sli. shs.	18
19			29.226																						Cloudy; showery bet. 9 a.m. & noon; sunny intvs. after 1.30 p.m.	19
20			29.494																						Dull; shs. early morning.	20
21			29.557																						Fog chiefly.	21
22			29.655																						Mostly cloudy till 1 p.m., then sunny; evening thick fog.	22
23			29.824																						Cloudy; hazy.	23
24			29.143																						Cloudy, with occas. sunshine abt. noon; shs. aft. 6 a.m. & const. r. after 6 p.m.	24
25			29.450																						Cloudy; nearly const. r. till noon; shs. later.	25
26			29.731																						Fine; freq. sunshine; a few li. shs.	26
27			29.687																						Cloudy, with occas. sunshine & drizzly shs. after 8.45 p.m.	27
28			29.319																						Cloudy; r. chiefly after 1.15 p.m.	28
29			29.168																						Overcast; freq. li. to mod. and brisk rain.	29
30			29.452																						Cloudy; thick drizzly r. at times.	30
31			29.754																						Cloudy; nearly constant rain.	31
Sums.																															
Means.																															
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.²	,,	heavy rain.
sl.	,,	sleet.
sn.	,,	snow.
so. ha.	,,	solar halo.
q.	,,	squall.
q.²	,,	violent squalls.
t.	,,	thunder.
t. s.	,,	thunder-storm.

CLOUDS.

HIGH CLOUDS.

Cirrus,	cir.
Cirro-stratus,	cir.-str.
Cirro-cumulus,	cir.-cum.

MIDDLE CLOUDS.

Strato-cirrus,	str.-cir.
Cumulo-cirrus,	cum.-cir.

LOWER CLOUDS.

Strato-cumulus,	str.-cum.
Cumulus,	cum.
Cumulo-nimbus,	cum.-nim.
Nimbus,	nim.
Stratus,	str.

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

FORCE.		FORCE.		FORCE.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
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, ½ (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.

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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.

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 writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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 flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

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,		
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.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of April 1909.

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. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max.	Min.	Black Bulb Max. in Sun.	Min. on Grass.	HYGROMETER. Dry No. ____ Wet No. ____ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	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.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.										°	°	°	°	°		
1			30·431																				Fine; mostly sunny; clear.	1
2			30·402																				Morng. thickr.-fr.; freq. sunshine duv. day; evning cloudy.	2
3			30·349																				Cloudy; r. after 5·30 pme.	3
4			30·343																				Cloudy; r. till 7 ame, + a few sli. shs. afternoon; brf sunshine abt. 5 pme.	4
5			30·440																				Fine; sunny.	5
6			30·448																				Fine; bright sunshine; nearly cloudless.	6
7			30·390																				Fine, sunny; hazy; thickr f. morng. evening.	7
8			30·270																				Fine; bright sunshine; hazy.	8
9			30·153																				Fine, sunny; hazy.	9
10			29·858																				Fine; mostly sunny; hazy; evning cloudy.	10
11			29·593																				Cloudy; shs bet. 0 & 10 pme. & 2 pme.; mostly sunny after 2·45 pme.	11
12			29·391																				Changeable; freq. r. after 9·30 ame.; sunny intvs. after 1·30 pme.	12
13			29·348																				Fine; sunny at times duv. forenoon; overcast const. r. after 3·30 pme.	13
14			29·352																				Mostly sunny; T+L, with r.+thl. at 2·50 pme.; clear.	14
15			29·876																				Fine; frequent sunshine.	15
16																								16
17																								17
18																								18
19			29·633																				Fine, sunny.	19
20			30·035																				Brickr. bet. 3·45 & 6·30 ame.; day fine, mostly sunny.	20
21			29·862																				Fine; sunny at times.	21
22			29·403																				Fine; freq. sunshine; showery after 7·30 pme.	22
23			29·588																				Fine; mostly sunny; r. about 1·30 pme.	23
24			29·409																				Fine; cloudy, with occas. sunshine.	24
25			29·633																				Changeable; r. till 8·30 ame. & brick shs. after 6. 10 pme.; freq. sunshine duv. afternoon.	25
26			29·591																				Changeable; freq. brickr shs.; occas. sunshine during forenoon.	26
27																								27
28																								28
29			29·802																				Fine, sunny at times till 3.15 pme, then showery.	29
30			29·984																				Changeable; bright sunshine at times, with freq. sli. su. & thl shs. & heavy thl & lt at 2·30 pme.	30
31																								31
Sums.																								
Means.																								
Corrections for Instrumental Errors.																								
Corrections for Diurnal Range.																								
Corrected Means																								

See Meteorological Register

See Meteorological Register

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.		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, ½ (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 FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

The errors most frequently made in reading the barometer are mistakes of 1·000 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 writen down, should be compared again with the scale.

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The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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.

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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.

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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.

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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 ·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 note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

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·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.

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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.

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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
| Cum. Str. S.W. | 2 |

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

In the Remarks column should be noted all occurrences of Snow, Hail, or Heavy Rain; of Thunder, or Lightning, or both together; of all Auroras, Meteors, or Halos round the sun or moon; 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.

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,		
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.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of May 1909.

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. corr. + red. to 32° sea-level. 9 A.M. Barometer. No. ___	9 A.M. Attached Thermometer	9 P.M. Barometer. No. ___	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	9 A.M. Wet bulb.	9 P.M. Dry bulb.	9 P.M. Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	9 A.M. Force. Scale of 0—12.	9 P.M. Direction.	9 P.M. Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	9 A.M. Amount (0—10).	9 P.M. Species and Direction.	9 P.M. Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	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.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.										°	°	°	°	°		
1			30·238																									Fine; frequent sunshine.	1
2			30·767																									Fine; mostly cloudy; clear; evening hazy. - So. ha. at 9.30 pm.	2
3			30·299																									Fine; cloudy, with occas. sunshine.	3
4			30·315																									Fine; mostly sunny bet. 11 am. and 2 pm.; otherwise cloudy.	4
5			30·444																									Fine; sunny; nearly cloudless.	5
6			30·450																									Fine; bright sunshine; mostly cloudless.	6
7			30·406																									Fine; bright sunshine; clear.	7
8			30·171																									Fine, clear, sunny.	8
9			30·146																									Fine, cloudy, sunny intvs. after 5 pm.	9
10			30·058																									Fine; sunny at times.	10
11			30·086																									Fine; cloudy, hazy; freq. sunshine dur. afternoon	11
12			30·285																									Changeable; freq. r. bet. 7.30 am. & 0.40 pm.; sunny at times dur. afternoon, with p.	12
13			30·259																									Fine; bright sunshine at times.	13
14			30·100																									Changeable, su. & softish shs. at 11.15 am. & 0.30 pm.; sunny at times. - Freq. So. ha. at 7.15 am	14
15			30·074																									Fine; sunny at times; clear.	15
16			29·969																									Fine; mostly sunny during afternoon; clear.	16
17			29·942																									Fine; mostly sunny; clear.	17
18			30·126																									Brisk r. at times bet. 4 & 6.30 am.; day fine, with freq. sunshine	18
19			30·221																									O'cast, nearly const. r. bet. 5.10 am. & noon; sunny intvs. dur. afternoon. - So. ha. at 5.50 pm	19
20			30·067																									Fine; mostly sunny; evening cloudy.	20
21			29·978																									Changeable; showery; sunny at times dur. afternoon.	21
22			30·004																									Fine; sunny.	22
23			30·127																									Fine; freq. sunshine after 1.30 pm.; p. at 11.5 am.	23
24			30·067																									Fine; mostly sunny.	24
25			29·557																									Overcast; showery; const. r. after 3 pm.	25
26			29·371																									Const. r. till 8 am.; freq. bright sunshine aft. 9.30 am.; T. & L. with r. at 4 pm.; cool, cloudy.	26
27			29·596																									Changeable; freq. heavy shs.; sunny at times.	27
28			29·600																									Fine, mostly sunny till noon; freq. shs. after 0.25 pm.	28
29			29·889																									Fine; a few shs. dur. forenoon; mostly sunny afternoon.	29
30			30·081																									Fine; mostly sunny; evening cloudy.	30
31			29·779																									Overcast; frequent rain.	31
Sums.																													
Means.																													
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.²	,, heavy rain.		
sl.	,, sleet.		
sn.	,, snow.		
so. ha.	,, solar halo.		
q.	,, squall.		
q.²	,, violent squalls.		
t.	,, thunder.		
t. s.	,, thunder-storm.		

CLOUDS.

High Clouds.	
Cirrus,	cir.
Cirro-stratus,	cir.-str.
Cirro-cumulus,	cir.-cum.
Middle Clouds.	
Strato-cirrus,	str.-cir.
Cumulo-cirrus,	cum.-cir.
Lower Clouds.	
Strato-cumulus,	str.-cum.
Cumulus,	cum.
Cumulo-nimbus,	cum.-nim.
Nimbus,	nim.
Stratus,	str.

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

Force.		Force.		Force.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
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, ½ (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 FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

The errors most frequently made in reading the barometer are mistakes of 1·000 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 writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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 flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

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,		
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.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of June 1909.

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. corr.ed to 32° and sea level. 9 A.M. Barometer. No. ____	9 A.M. Attached Thermometer	9 P.M. Barometer. No. ____	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max.	Min.	Black Bulb Max. in Sun. No. ____	Min. on Grass. No. ____	HYGROMETER. Dry No. ____ Wet No. ____ 9 A.M. Dry bulb.	9 A.M. Wet bulb.	9 P.M. Dry bulb.	9 P.M. Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	9 A.M. Force. Scale of 0—12.	9 P.M. Direction.	9 P.M. Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	9 A.M. Amount (0—10).	9 P.M. Species and Direction.	9 P.M. Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	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.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°		
1			30·022																					Cloudy, showery till 10 a.m.; mostly sunny dur. afternoon	1
2			30·198																					Fine; sunny at times, clear; sho. at 5 a.m.	2
3			30·093																					Fine; mostly sunny; evening cloudy	3
4			29·910																					Cloudy, with occas. sunshine; drizz. r. at times after 5.40 p.m.	4
5			29·901																					R. chiefly till 8 a.m.; mostly sunny after 10.30 a.m.	5
6			30·047																					Fine; mostly sunny; a few sli. sho.; very clear	6
7			30·009																					Fine, sunny; evening cloudy. - Faint So. ha. at 6 p.m.	7
8			30·046																					Fine; cloudy till about noon, then sunny	8
9			30·117																					Fine; mostly sunny after 10 a.m.; evening cloudy	9
10			30·062																					Fine; sunny at times; sli. sho. after 5.45 p.m.	10
11			30·100																					Fine; cloudy, with occas. brief sunshine; clear	11
12			30·123																					Fine, sunny; clear.	12
13			30·218																					Fine; bright sunshine; mostly cloudless; clear	13
14			30·328																					Fine, sunny; clear.	14
15			30·275																					Fine; sunny after 9.40 a.m.	15
16			30·242																					Morning and evening cloudy; bright sunshine during day.	16
17			30·331																					Fine, sunny.	17
18			30·186																					Cloudy; r. till 6.45 a.m.; mostly sunny dur. afternoon; avg. cloudy.	18
19			29·987																					Fine; cloudy till abt. 11.30 a.m., then mostly sunny; avg. cloudy	19
20			29·655																					Changeable; sho. till 8.15 a.m. + frq. heavy sho. after 3.5 p.m.; bright sunshine at times.	20
21			29·457																					Mostly cloudy; showery after 1 p.m.	21
22			29·201																					Cloudy; r. early morning + after 5.30 p.m.; thickh. at times.	22
23			29·512																					Cloudy, with occas. sunshine; sho. early morn. + heavy sho at 2.50 p.m.	23
24			29·792																					Fine, except sho. early morng.; mostly sunny dur. afternoon; clear.	24
25			29·950																					Mostly cloudy; a few sli. sho.	25
26			29·965																					Fine, cloudy, with sunny intervs. but 1 to 7 p.m.; clear; r. after 9 p.m.	26
27			29·961																					Overcast; frisk r. prev. night and drizz. r. at times dur. day.	27
28			30·009																					Fine; bright sunshine after 10.30 a.m.	28
29			30·015																					Fine; frequent sunshine after 10 a.m.	29
30			30·162																					Fine, sunny	30
31																															
Sums.																															
Means.																															
Corrections for Instrumental Errors.																															
Corrections for Diurnal Range.																															
Corrected Means																															

NOTATION USED IN GENERAL REMARKS.

a.	*denotes* aurora.	
d.	,,	drizzling rain.
f.	,,	fog.
fr.	,,	[illegible].
h.-fr.	,,	[illegible]r-frost.
h.	,,	[illegible]aze.
hl.	,,	hail.
l.	,,	lightning.
lu. c.	,,	lunar corona.
lu. ha.	,,	lunar halo.
m.	,,	mist.
p.	,,	passing showers.
r.	,,	rain.
r.²	,,	heavy rain.
sl.	,,	sleet.
su.	,,	snow.
so. ha.	,,	solar halo.
q.	,,	squall.
q.²	,,	violent squalls.
t.	,,	thunder.
t. s.	,,	thunder-storm.

CLOUDS.

HIGH CLOUDS.

Cirrus, . . .	cir.
Cirro-stratus, . .	cir.-str.
Cirro-cumulus, . .	cir.-cum.

MIDDLE CLOUDS.

Strato-cirrus, . .	str.-cir.
Cumulo-cirrus, . .	cum.-cir.

LOWER CLOUDS.

Strato-cumulus, . . .	str.-cum.
Cumulus, . . .	cum.
Cumulo-nimbus, . . .	cum.-nim.
Nimbus, ...	nim.
Stratus, ...	str.

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

FORCE.		FORCE.		FORCE.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
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, ½ (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 FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

The errors most frequently made in reading the barometer are mistakes of 1·000 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 writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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 flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

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,		
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.

ADDITIONAL REMARKS.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

BOOK POST.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of July 1909.

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. 9 A.M. Barometer. No.	Attached Thermometer	9 P.M. Barometer. No.	Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	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.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°		
1			30·225																					Fine; bright sunshine; clear.	1
2			30·030																					Cloudy; hazy; brisk sho. bet. 0.10 p.m. & 2.15 p.m.	2
3			29·800																					Cloudy, with occas. sunshine; r. bet. 1.35 & 4 p.m. & pass. sh. at 6 p.m.	3
4			29·956																					Fine; mostly sunny.	4
5			29·663																					Cloudy, with sunny intervs. forenoon; freq. brisk r. after 3.50 p.m.	5
6			29·440																					Changeable; freq. brisk sho.; bright sunshine at times.	6
7			29·854																					Cloudy, with freq. heavy sho.; sunny at times dur. afternoon.	7
8			30·001																					Fine; bright sunshine.	8
9			29·577																					Cloudy; a few sli. sho.; const. r. bet. 4 and 7.45 p.m.	9
10			29·746																					Fine except sho. bet. 11 a.m. and noon; freq. sunshine.	10
11			30·002																					Fine; cloudy, with occas. sunshine.	11
12			29·960																					Fine; mostly sunny dur. afternoon.	12
13			29·927																					Fine; mostly sunny.	13
14			29·969																					Fine except brisk sh. at 11.35 a.m.; very dull at times dur. forenoon; [early morning. bright sunshine	14
15			29·793																					Cloudy; r. after 5 p.m.	15
16			29·734																					R. prev. night; day fine; sunny after 1.30 p.m.	16
17			29·957																					Fine; mostly sunny.	17
18			30·107																					Sho. early morning; day fine, sunny; clear.	18
19			30·155																					Fine, sunny; clear.	19
20			29·734																					Fine till 3 p.m. then sli. sho.; r. chiefly after 4 p.m.	20
21			29·591																					Fine; freq. sunshine; r. after 8.40 p.m.	21
22			29·379																					Cloudy, with occas. sunshine; a few li. sho. & mod. to brisk r. bet. 6.15 & 7.15 p.m.	22
23			29·289																					Freq. sunshine; a few li. sho.	23
24			29·474																					Changeable; freq. sunshine; a few brisk sho.	24
25			29·199																					E. coast, freq. brisk r. aft. 10.30 a.m.; dist. T. at 4.50 p.m. & T. L. with very r. bet. 5.7 & 5.40 p.m.	25
26			29·640																					R. till 7 a.m.; fine, sunny at times till aft. 3 p.m.; brisk sho. after 3.45 p.m.	26
27			29·802																					Fine; much cloud at times; sunny intervs.	27
28			29·832																					Fine, except sho. bet. 6.10 & 7 a.m.; freq. sunshine.	28
29			29·607																					Cloudy, with sunny intervs.; sho. early morning & sli. sho. after 7.50 p.m.	29
30			29·780																					Fine; freq. sunshine after 10.30 a.m. & much cloud at times.	30
31			29·967																					Fine; mostly sunny; evening cloudy.	31
Sums.																														
Means.																														
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.²	,,	heavy rain.
sl.	,,	sleet.
sn.	,,	snow.
so. ha.	,,	solar halo.
q.	,,	squall.
q.²	,,	violent squalls.
t.	,,	thunder.
t. s.	,,	thunder-storm.

CLOUDS.

HIGH CLOUDS.	
Cirrus,	cir.
Cirro-stratus,	cir.-str.
Cirro-cumulus,	cir.-cum.
MIDDLE CLOUDS.	
Strato-cirrus,	str.-cir.
Cumulo-cirrus,	cum.-cir.
LOWER CLOUDS.	
Strato-cumulus,	str.-cum.
Cumulus,	cum.
Cumulo-nimbus,	cum.-nim.
Nimbus,	nim.
Stratus,	str.

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

FORCE.		FORCE.		FORCE.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
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, ½ (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.

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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.

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 writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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. of 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 note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

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,		
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.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of August 1909.

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. corr. + red. to 32° + sea-level. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	9 A.M. Wet bulb.	9 P.M. Dry bulb.	9 P.M. Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	9 A.M. Force. Scale of 0—12.	9 P.M. Direction.	9 P.M. Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	9 A.M. Amount (0—10).	9 P.M. Species and Direction.	9 P.M. Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	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.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.												°	°	°	°	°		
1			30·090																						Overcast; freq. sli. sho.; nearly const. r. after 5.30 pme.	1
2			30·236																						Cloudy; r. prev. night; mostly sunny towards evening.	2
3			30·046																						Cloudy, with occas. sunshine; drizz. sho. after 4.15 pme	3
4			30·062																						Cloudy, with occas. sunshine; sho. after 4.20 pme, & drizz. r. after 7 pme	4
5			30·247																						Cloudy; hazy; drizz. sho. after 5.45 pme.	5
6			30·157																						Fine; bright sunshine.	6
7			30·113																						Fine, sunny.	7
8			30·077																						Fine; bright sunshine; evening cloudy.	8
9			30·109																						Fine, sunny.	9
10			30·173																						Fine; cloudy till abt. 9.30 ame, then sunny; hazy.	10
11			30·172																						Fine; mostly sunny; evening cloudy.	11
12			29·946																						Morng. cloudy; fine, sunny bet. 10 ame & 3 pme; cloudy, freq. r. after 4.40 pme	12
13			30·094																						Fine, sunny; morning and evening cloudy.	13
14			30·037																						Fine; mostly sunny; brisk sho. at and about 2.30 pme	14
15	29·971		29·807																						Fine; bright sunshine.	15
16			29·660																						Mostly fine; cloudy, with a few sli. sho.; freq. sunshine dur. afternoon.	16
17			29·716																						Cloudy; fine.	17
18			29·554																						Cloudy; drizz. r. early morning.	18
19			29·746																						Fine, except sho. at 5 and 6 ame.; freq. sunshine.	19
20			29·589																						Sho. after 5 ame. & brisk sho. bet. 9 & 10 ame.; mostly sunny after 2 pme.	20
21			29·586																						Changeable; a few brisk sho.; freq. sunshine.	21
22	29·625		29·644																						Fine; sunny at times.	22
23			29·578																						Overcast; freq. thick drizz. r. after 5.45 ame; evening fog.	23
24			29·589																						Cloudy; sho. after 2 pme.	24
25			29·893																						Overcast; freq. rain.	25
26			29·908																						Fine; freq. sunshine after 10.30 ame.	26
27			30·141																						Fine; mostly sunny.	27
28			30·005																						Fine; cloudy, with occas. sunshine; li. sho. bet. 6 and 7 pme	28
29	29·852		29·856																						Overcast; r. till noon, then fine; mostly sunny after 2 pme	29
30			29·512																						R. previous night; day fine, sunny at times	30
31			29·828																						Fine; mostly cloudy.	31
Sums.			13 15/16 28·171																												
Means.			29·909																												
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.²	,,	heavy rain.
sl.	,,	sleet.
sn.	,,	snow.
so. ha.	,,	solar halo.
q.	,,	squall.
q.²	,,	violent squalls.
t.	,,	thunder.
t. s.	,,	thunder-storm.

CLOUDS.

High Clouds.

Cirrus,	cir.
Cirro-stratus,	cir.-str.
Cirro-cumulus,	cir.-cum.

Middle Clouds.

Strato-cirrus,	str.-cir.
Cumulo-cirrus,	cum.-cir.

Lower Clouds.

Strato-cumulus,	str.-cum.
Cumulus,	cum.
Cumulo-nimbus,	cum.-nim.
Nimbus,	nim.
Stratus,	str.

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

Force.		Force.		Force.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
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, ½ (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*) _____

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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.

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The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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.

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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 note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

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,		
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.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of September 1904.

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 corr. & red. to 32° and sea-level. 9 A.M. Barometer. No. ____	9 A.M. Attached Thermometer	9 P.M. Barometer. No. ____	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ____ Wet No. ____ 9 A.M. Dry bulb.	9 A.M. Wet bulb.	9 P.M. Dry bulb.	9 P.M. Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	9 A.M. Force. Scale of 0—12.	9 P.M. Direction.	9 P.M. Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	9 A.M. Amount (0—10).	9 P.M. Species and Direction.	9 P.M. Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	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.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.										°	°	°	°	°		
1			29.896																				Fine; frequent sunshine.						1
2			29.988																				Fine, sunny; evening cloudy.						2
3			29.911																				Mostly cloudy; a few li. shs.						3
4			29.759																				Fine except brisk shs. bet. 10 a.m. & 0.30 p.m.; freq. sunshine dur. afternoon						4
5			29.859																				Fine; mostly sunny; evening cloudy.						5
6			29.271																				Changeable; freq. brisk shs. till 6.30 a.m. & abt. 3 p.m.; bright sunshine at times						6
7			29.817																				Shs. early morning; day cloudy but fine.						7
8			30.139																				Fine; cloudy, with occas. sunshine.						8
9			30.114																				Fine, except brisk shs. bet. 5.15 & 6.30 a.m.; freq. sunshine after 11.30 a.m.						9
10			30.163																				Fine, sunny.						10
11																													11
12																													12
13																													13
14																													14
15																													15
16																													16
17																													17
18																													18
19																													19
20																													20
21			29.798																				Overcast; shs. bet. 4.45 & 5.30 p.m., & const. r. after 7 p.m.						21
22			30.016																				R. previous night; day cloudy, with occas. sunshine dur. forenoon.						22
23			30.126																				Fog; const. r. after 6 p.m.; T. & L., visible r^2 bet. 9.10 & 9.40 p.m.						23
24			30.126																				R. previous night; fog chiefly.						24
25			30.251																				Overcast; frequent r.						25
26			30.260																				Overcast; drizz. shs. till about 8 a.m., and after 7.30 p.m.						26
27			30.132																				Cloudy; li. shs. after 5.30 p.m.						27
28			30.036																				Cloudy; brisk r. early morning & drizz. r. till abt. 10 a.m., long clear.						28
29			29.931																				Fine, sunny.						29
30			29.758																				Fine; cloudy; hazy.						30
31																													31

See Mr. Dobson's Register

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

CLOUDS.

High Clouds.

Cirrus,	cir.
Cirro-stratus,	cir.-str.
Cirro-cumulus,	cir.-cum.

Middle Clouds.

Strato-cirrus,	str.-cir.
Cumulo-cirrus,	cum.-cir.

Lower Clouds.

Strato-cumulus,	str.-cum.
Cumulus,	cum.
Cumulo-nimbus,	cum.-nim.
Nimbus,	nim.
Stratus,	str.

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

Force.		Force.		Force.	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
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, ½ (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 FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

The errors most frequently made in reading the barometer are mistakes of 1·000 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 writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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.

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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,

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Cum. Str. S.W.	2

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

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,		
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.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of October 1909.

Lat. 55°59′31″, 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. corr.s Red. to 32° and sea-level. 9 A.M. Barometer. No.	9 A.M. Attached Thermometer	9 P.M. Barometer. No.	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS. Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ___ Wet No. ___ 9 A.M. Dry bulb.	Wet bulb.	9 P.M. Dry bulb.	Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	Force. Scale of 0—12.	9 P.M. Direction.	Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	Amount (0—10).	9 P.M. Species and Direction.	Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	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.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°		
1			29.675																					Fine; sunny at times; hazy.	1
2			29.686																					Fine, occas. sunshine till abt. 2 pm.; shs. after 3.45 pm.	2
3			29.459																					Mostly cloudy; r. bet. 7.15 and 3.30 pm.; shs. later.	3
4			29.449																					Shs. early morng; day fine, mostly sunny; evng. cloudy; shs. after 7 pm.	4
5			29.275																					Changeable; frq. shs.; sunny at times; equally dist. afternoon.	5
6			29.642																					Changeable; r. dgs bet. 4 & 5 am.; freq. shs. dur. forenoon; mostly sunny afternoon	6
7			29.186																					Mostly cloudy; a few sl. shs.; equally at times.	7
8			29.966																					Shs. till about 8 am.; mostly sunny after 11 am.	8
9			29.888																					Fine; sunny till 7 pm, then cloudy.	9
10			29.680																					Cloudy; frq. r. after 3.15 pm.	10
11			29.568																					Cloudy; heavy shs. at times after 7.10 pm.; evening clear.	11
12			29.494																					Changeable; sunny intvs. at & abt. noon; prev. brisk r. after 1.30 pm.; evng. clear	12
13			29.585																					Frq. r.² bet. 6.45 am. and 1 pm., and brisk shs. at intvs. later.	13
14			29.222																					Fine, mostly sunny till 11.30 am. then cloudy; r² at times after 4 pm.; very squally later.	14
15			29.300																					Frq. sunshine; brisk shs. after 3.15 pm.	15
16			29.393																					Fine, mostly sunny till abt. 1 pm, then cloudy; showery after 3.40 pm.	16
17			29.436																					R. previous night; day cloudy; hazy; sl. sunshine abt. 1.45 pm.	17
18			29.785																					Overcast; freq. drizz. r.; hazy.	18
19			29.527																					Mostly cloudy; shs. early morng, dies after 5 pm.; very equally.	19
20			29.381																					Shs. early morning; mostly sunny; cloudy, showery after 6 pm.	20
21			29.784																					Changeable; showery; frequent sunshine.	21
22			29.589																					Changeable; showery; very equally.	22
23			29.769																					Sq. prev. night; day cloudy, with occas. sunshine; freq. r² after 7.45 pm.	23
24			29.655																					Freq. shs till 1 pm, then fine; mostly sunny after 3 pm.; clear.	24
25			29.802																					Fine, sunny.	25
26			29.830																					Changeable; frq. r. shs. separated by sunny intvs. after 11.30 am.; heavy hl. shs. at [3.35 to 3.55 pm.	26
27			29.917																					Fine; mostly sunny. – Faint Lt. ha. at 5.50 pm.	27
28			29.885																					Fine, sunny.	28
29			29.942																					Morning, thick h.-fr.; day fine, sunny at times.	29
30			30.073																					Morning, thick h.-fr.; cloudy; drizz. dist. after 5 pm.	30
31			30.323																					Sunny, mostly cloudless after 10.45 am.; morng very thick (a)	31
Sums.			17.814																											
			19.556																											
Means.			29.631																											
Corrections for Instrumental Errors.																														
Corrections for Diurnal Range.																														
Corrected Means																														

NOTATION USED IN GENERAL REMARKS.

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

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

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

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, ½ (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 FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

The errors most frequently made in reading the barometer are mistakes of 1·000 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 writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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 flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

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,		
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.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of November 1909.

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 (corr. red. to 32° & sea-level) 9 A.M. Barometer No. (inches)	9 A.M. Attached Thermometer (°)	9 P.M. Barometer No. (inches)	9 P.M. Attached Thermometer (°)	Self-Registering Thermometers, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground Max. No. (°)	Min. No. (°)	Black Bulb Max. in Sun No. (°)	Min. on Grass No. (°)	Hygrometer Dry No. Wet No. 9 A.M. Dry bulb (°)	9 A.M. Wet bulb (°)	9 P.M. Dry bulb (°)	9 P.M. Wet bulb (°)	Rain Amount at 9 A.M. (inches)	Wind 9 A.M. Direction	9 A.M. Force Scale of 0–12	9 P.M. Direction	9 P.M. Force Scale of 0–12	Anemometer 9 A.M.	Clouds 9 A.M. Species and Direction	9 A.M. Amount (0–10)	9 P.M. Species and Direction	9 P.M. Amount (0–10)	Sunshine Hours	Thermometers under Ground 9 A.M. No. 3 ins. (°)	No. 12 ins. (°)	No. 22 ins. (°)	No. 36 ins. (°)	No. 48 ins. (°)	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
1			29·993																										Morng. thick h.-fr.; freq. sunshine; hazy; cloudy, but much clearer at 9 pm.	1
2			29·958																										Overcast; damp; fog at times.	2
3			30·102																										Cloudy; thick h. chiefly.	3
4			30·071																										Fine; occas. sunshine; hazy.	4
5			29·938																										Cloudy; shs. bet. 1 and 2 pm.	5
6			30·100																										Fine, sunny.	6
7			30·343																										Fine; mostly sunny.	7
8			30·150																										Cloudy; fine; thick h.-fr. in the morning.	8
9			29·715																										Cloudy; drizz. r. at times; hazy; evening squally.	9
10			30·105																										Fine; mostly sunny.	10
11			29·760																										Cloudy; hazy; li. shs. at & about noon; evening squally.	11
12			29·168																										Cloudy; squally after 4 pm.; evening showery.	12
13			29·705																										Squally prev. night; day fine, sunny.	13
14			29·744																										Fine; clear; sunny.	14
15			30·074																										Mostly sunny; hazy.	15
16			30·235																										Low fog, with thick h.-fr.; sunny bet. 10 am. and 3 pm.	16
17			30·308																										Low fog; mostly sunny bet. 10 am and 3 pm.	17
18			30·293																										Fog; brief sunshine about 10 am.	18
19			30·242																										Fine; hazy; evening cloudy.	19
20			30·167																										Cloudy.	20
21			30·086																										Fine; sunny at times; li. shs. about 10 am.	21
22			30·299																										Fine; freq. sunshine; hazy.	22
23			30·362																										Fine; mostly cloudy; hazy.	23
24			30·330																										Fine; mostly sunny after 10 am.; hazy.	24
25			30·178																										Fine; hazy.	25
26			29·838																										Fine; frequent sunshine; li. shs. about 7.45 pm.	26
27			29·571																										Changeable; freq. sunshine dur. forenoon; li. shs. bet. 6 & 7.30 am. & brisk r. at times bet. 1 pm & 4 pm.	27
28			29·161																										Cloudy; freq. li. r. after 9 am.; squally after 4 pm.	28
29			28·879																										Fine; freq. sunshine.	29
30			29·045																										Squally, with freq. heavy shs. early morning; day mostly fine; sunny at times.	30
31																														31
Sums.																														
Means.																														
Corrections for Instrumental Errors.																									Nov. 29. 10 pm. 28·867 " 30. 6 am. 28·855 " 30. 7 am. 28·849					
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.²	,,	heavy rain.
sl.	,,	sleet.
sn.	,,	snow.
so. ha.	,,	solar halo.
q.	,,	squall.
q.²	,,	violent squalls.
t.	,,	thunder.
t. s.	,,	thunder-storm.

CLOUDS.

High Clouds.	
Cirrus,	cir.
Cirro-stratus,	cir.-str.
Cirro-cumulus,	cir.-cum.
Middle Clouds.	
Strato-cirrus,	str.-cir.
Cumulo-cirrus,	cum.-cir.
Lower Clouds.	
Strato-cumulus,	str.-cum.
Cumulus,	cum.
Cumulo-nimbus,	cum.-nim.
Nimbus,	nim.
Stratus,	str.

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

Force		Force		Force	
0	Calm.	5	Fresh Breeze.	9	Strong Gale.
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, ½ (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. Direction.	N	NE	E	SE	S	SW	W	NW	Calm or Variable.	Mean Force 0—12.
A.M.										
P.M.										
Sum.										

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 FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

The errors most frequently made in reading the barometer are mistakes of 1·000 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 writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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 flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
———
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

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,		
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.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
122 *George Street,*
EDINBURGH.

SCOTTISH METEOROLOGICAL SOCIETY.

Observations taken at Leith, County of Edinburgh, During the MONTH of December 1909.

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. corr.ᵈ red. to 32° + sea-level. 9 A.M. Barometer. No. ____	9 A.M. Attached Thermometer	9 P.M. Barometer. No. ____	9 P.M. Attached Thermometer	SELF-REGISTERING THERMOMETERS, Read Daily, at 9 P.M. Protected in Screen, 4 feet above Ground. Max. No.	Min. No.	Black Bulb Max. in Sun. No.	Min. on Grass. No.	HYGROMETER. Dry No. ____ Wet No. ____ 9 A.M. Dry bulb.	9 A.M. Wet bulb.	9 P.M. Dry bulb.	9 P.M. Wet bulb.	RAIN. Amount at 9 A.M.	WIND. 9 A.M. Direction.	9 A.M. Force. Scale of 0—12.	9 P.M. Direction.	9 P.M. Force. Scale of 0—12.	Anemometer. 9 A.M.	CLOUDS. 9 A.M. Species and Direction.	9 A.M. Amount (0—10).	9 P.M. Species and Direction.	9 P.M. Amount (0—10).	SUNSHINE. Hours.	THERMOMETERS under Ground. 9 A.M. No. 3 ins.	No. 12 ins.	No. 22 ins.	No. 36 ins.	No. 48 ins.	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.
	inches.	°	inches.	°	°	°	°	°	°	°	°	°	inches.											°	°	°	°	°		
1			29.071																										Overcast; const. li. to mod. r. after 8 a.m.; fair, clear at 9 p.m.	1
2			28.599																										Fine; sunny at times; r. after 7.15 p.m.	2
3			28.650																										Strong sqs. with r.ˢ p.m. night; day fine, mostly cloudy.	3
4			28.871																										Fine; mostly sunny.	4
5			29.107																										Morning thickh. fr.; day fine, sunny; thickh. low haze.	5
6			29.216																										Thick fog; evening clearer.	6
7																															7
8			Ill.																												8
9																															9
10			29.676																										Changeable; showery, squally at times; occas. sunshine.	10
11			29.848																										Overcast; const. r.	11
12			30.306																										R. prev. night; day fine; mostly sunny after 11.30 a.m.	12
13			30.571																										Cloudy; drizz. r. early morning; hazy.	13
14			30.652																										Cloudy; drizz. shs. after 5.15 p.m.	14
15			30.472																										Cloudy; fine; clear.	15
16			30.116																										Cloudy; brisk shs. at 7.45 a.m.	16
17			29.554																										Cloudy.	17
18			29.414																										Fine; mostly sunny.	18
19			29.204																										Sunny; hazy. - Sc.-ha. at 10.50 a.m.	19
20			29.469																										Fine; sunny at times; li. en. bet. 9 and 9.30 a.m.	20
21			29.621																										Cloudless; sunny; hazy. - Lu.-ha. at 9 p.m.	21
22			28.665																										Cloudy; sn. sl. bet. 4 a.m. & 10 a.m. and li. r. dur. evening.	22
23			29.051																										Cloudy; hazy; drizz. shs. early morng. - Lu.-ha. at 5.45 p.m.	23
24			29.508																										Changeable; sunny at times; shs. after 2.40 p.m.	24
25			29.683																										Changeable; li. shs. after 8.15 a.m.; mostly sunny dur. afternoon.	25
26			29.340																										Changeable, showery, squally after 2.50 a.m.; occas. brief sunshine.	26
27			29.427																										Fine; hazy; calming overcast; r. after 5.45 p.m.	27
28			29.632																										Squally early morning; day fine, mostly sunny; showery after 4.45 p.m.	28
29			30.206																										Fine; mostly cloudy; hazy.	29
30			29.898																										Fine; cloudy, with occas. sunshine	30
31			30.110																										Shs. between 6 & 7 a.m.; day fine, mostly sunny.	31
Sums.																															
Means.																															
Corrections for Instrumental Errors.																															
Corrections for Diurnal Range.																															
Corrected Means																															

Dear. 2. 10 p.m. 28.517
" " 10.30 " 28.459
" 3. 1 a.m. 28.282
" 3. 6 a.m. 28.295
" 3. 7 a.m. 28.311
" 22. 8 p.m. 28.663.

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.		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, ½ (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 FOR TAKING METEOROLOGICAL OBSERVATIONS.

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

HOURS OF OBSERVATION.

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

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

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

BAROMETER.

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

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

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

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

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

The errors most frequently made in reading the barometer are mistakes of 1·000 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 writen down, should be compared again with the scale.

STEVENSON SCREEN.

The Maximum, Minimum, Dry Bulb, and Wet Bulb Thermometers should be placed in a louvred 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 flyleaf of the note-book or other convenient place before the glass is emptied. Thus after heavy rain the amounts measured might be:—

·47
·42
·38
1·27

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

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

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

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

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

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

WIND, CLOUD, SUNSHINE, ETC.

WIND.

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

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

CLOUDS.

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

Thus, for example,

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

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

SUNSHINE.

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

RADIATION THERMOMETERS.

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

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

THERMOMETERS UNDER GROUND.

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

REMARKS.

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

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

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, ...		
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.

ADDITIONAL REMARKS.

BOOK POST.

THE SECRETARY,
Scottish Meteorological Society,
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EDINBURGH.

Leith
1909